Vol. 996 Number 4

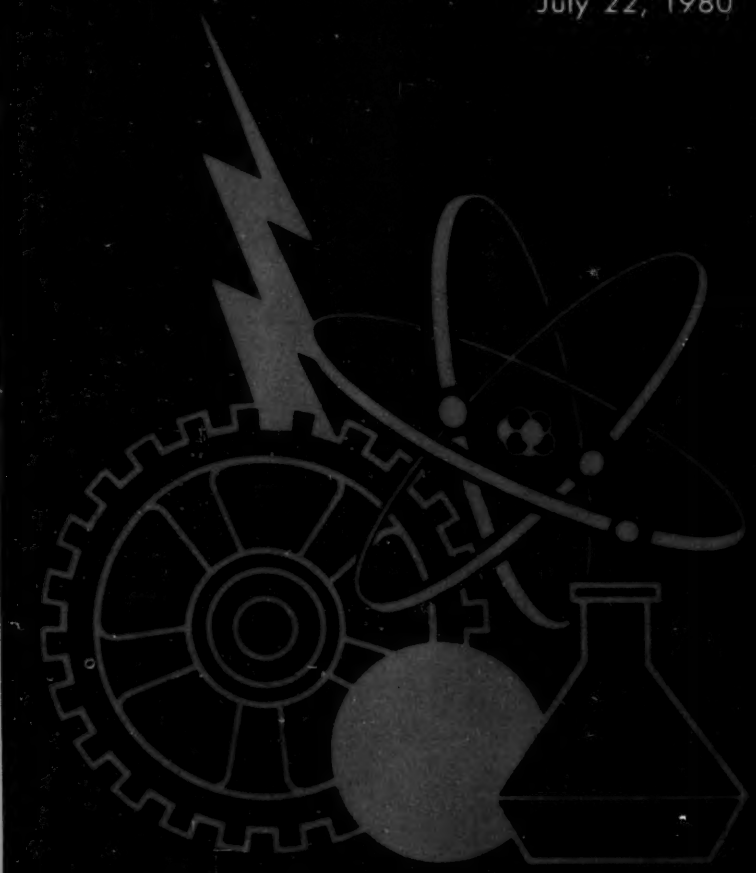
# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 22, 1980



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 22, 1980 Volume 996 Number 4


## CONTENTS


| | Page |
|---|---|
| Patent and Trademark Notices | |
| Patent Cooperation Treaty (PCT) Information | 996 OG 34 |
| Errata | 996 OG 34 |
| Registration to Practice | 996 OG 34 |
| Reissue Applications Filed | 996 OG 36 |
| Patent Notices | |
| Certificates of Correction for the Week of July 22, 1980 | 996 OG 37 |
| Adverse Decisions in Interferences | 996 OG 37 |
| Disclaimers | 996 OG 37 |
| National Technical Information Service | 996 OG 37 |
| Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries | 996 OG 39 |
| Condition of Patent Applications | 996 OG 40 |
| Reissue Patents Granted (30,340) | 1171 |
| Plant Patents Granted (4,576) | 1175 |
| Patents Granted | |
| General and Mechanical (4,213,202) | 1177 |
| Chemical (4,213,757) | 1365 |
| Electrical (4,214,117) | 1469 |
| Design Patents Granted (255,952) | 1539 |
| Index of Patentees | PI 1 |
| Indices of Applicants of Reissues, Plants and Designs | PI 40 |
| Classification of | |
| Patents (Including Reissues) | PI 43 |
| Designs and Plants | PI 45 |
| Geographical Index of Residence of Inventors | |
| Patents (Including Reissues) | PI 46 |
| Designs and Plants | PI 47 |
| Change of Address Form and Subscription Order Form | Back Page |



The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

GENERAL INFORMATION concerning TRADEMARKS, price $1.50 each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS AND DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

# PATENT AND TRADEMARK OFFICE NOTICES

## Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

| | |
|---|---|
| Transmittal fee | $35.00 |
| Search fee | 300.00 |
| Basic fee (first 30 pages) | 190.00 |
| Basic fee supplement (each sheet over 30) | 3.50 |
| Designation fee | 45.00 |

SIDNEY A. DIAMOND,
June 17, 1980. *Commissioner of Patents and Trademarks.*

## Errata

The information appearing in the Patent Suits of Nov. 6, 1979 at page 988 OG 3 for 3,214,510 is in error. It should read as follows:

3,214,520, Avakian and Buegler, QUERY-REPLY SIGNAL PROCESSING APPARATUS, filed May 11, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1681, Bunker Ramo Corp. v. Western Electric Company Inc. Transferred to D.C., S.D.N.Y. on Mar. 23, 1979.

## Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before August 28, 1980.

LUTRELLE F. PARKER,
June 26, 1980. *Chairman, Committee on Enrollment.*

A

Adler, Marc S., 11 Welwyn Road, Great Neck, N.Y. 11021
Aguirre, Rodolfo, 30104 Via Borica, Rancho Palos Verdes, Calif. 90274
Allen, Paul T., Jr., 3806 Ivydale Drive, Annandale, Va. 22003
Althoen, David J., 815 N. Janss St., Anaheim, Calif. 92805
Anderson, Albert S., 798 Longwood Drive, NW., Atlanta, Ga. 30305
Anderson, Philip J., 204 S. Hollister, Apt. 10, Pasadena, Calif. 91106
Angres, Isaac A., 34 Wade Court, Gaithersburg, Md. 20760

B

Banner, Mark T., 268 Carriage Hill Drive, Aurora, Ill. 60506
Barbeau, David L., 1646 East 54th St., Chicago, Ill. 60615
Barry, James H., 7123 Olivetas Ave., La Jolla, Calif. 92037
Bauer, Laura A., 256 Burns St., Forest Hills N.Y. 11375
Bechtel, James B., P.O. Box 1043, Ridgecrest, Calif. 93555
Belani, Jagdish G., 5373 Ayrshire Drive, San Jose, Calif. 95118
Benson, Kurt R., 12 Dean St., Worcester, Mass. 01609
Bent, Stephen A., 310 Domer Ave., Apt. 5, Takoma Park, Md. 20012
Berger, Stephen L., 1038 S. 19th St., Arlington, Va. 22202
Bertele, Edward A., 409 Knoll Road, Boonton, N.J. 07005
Bianchi, Alden J., 405 N. Wabash Ave., Apt. 1706, Chicago, Ill. 60611
Birde, Patrick J., 175-51 Dalny Road, Jamaica, N.Y. 11432
Blackmer, Richard L., P.O. Box 82037, College, Alaska 99708
Blackstone, William M., 5811 Stanton Ave., Pittsburgh, Pa. 15206
Blecker, Ira D., 91 Concord St., East Hartford, Conn. 06108
Bohan, Thomas L., 74 Rumford St., Concord, N.H. 03301
Boles, Donald M., 271 Beechwood Road, Oradell, N.J. 07649
Boos, Arthur C., 1505 Winrock, Apt. 10003, Houston, Tex. 77057
Bos, Catherine J., 606 Calle Palo Colorado, Santa Barbara, Calif. 93105
Breland, Patricia A., 802 Hollybluff, Austin, Tex. 78753
Breninger, Thomas M., 140 N. Pine Circle, Gibsonia, Pa. 15044
Brooks, James C., 5721 1st St. South, Arlington Va. 22202
Brown, Scott H., 3260 S. Cincinnati, Apt. 306, Tulsa, Okla. 74105
Burg, Harold, 420 Cedarhaven Way, Anaheim, Calif. 92807
Burns, William W., 140 Newell Ave., Los Gatos Calif. 95030
Burpee, Charles E., 1946 Chamberlain, SE., Grand Rapids, Mich. 49506

C

Campbell, Raymond W., 17596 Bryan, South Bend, Ind. 46635
Cantey, Edward B., Jr., 161 Henry St., Brooklyn, N.Y. 11201
Carrara, John J., 4225 N. 2nd Road, Arlington, Va. 22203
Carroll, David H., 6280 Ridge Drive, Bethesda Md. 20016
Carvalko, Joseph R., Jr., RD 1 Redwood Drive, Bethel, Conn. 06801
Cascio, Anthony T., 2364 Damascus Ct., San Jose, Calif. 95125
Caserza, Steve F., 321 Hillcrest, Millbrae, Calif. 94030
Casner, Mack J., 5404 Prince Edward, El Paso, Tex. 79924
Cayen, Donald J., Route 6, Fond Du Lac, Wis. 54935
Charney, Howard S., 4872 Kingbrook Drive, San Jose, Calif. 95124
Chen, John Y., 1336 Oddstad Blvd., Pacifica, Calif. 94044
Chiang, Chu-I, 375A Harvard St., Apt. 16A, Cambridge, Mass. 02138
Clarke, Pauline A., 617 Vista Ave., Palo Alto, Calif. 94306
Church, Marla J., 212 Seegar Road, Pittsburgh, Pa. 15241
Coca, T. Rao, 4296 Stonehaven Drive, Kettering, Ohio 45429
Codd, Norman L., 3920 Vantage Ave., Studio City, Calif. 91770
Cohen, Lester H., 9921 Bustleton Ave., Apt. E-8, Philadelphia, Pa. 19115
Coon, Gerald L., 39 Hollandale Road, Danbury, Conn. 06810
Cox, Roland O., 3325 Valiant Drive, Dallas Tex. 75234
Coyne, Brian J., 2918 S. Orange St., Olympia, Wash. 98501
Custer, Milton F., 4885 North Point, Byron, Calif. 94514

D

Daley, Thomas F., 7906 Red Mill Drive, West Chester, Ohio 45069
Date, Raghunath V., 45 Gibson Ave., Trumbull, Conn. 06611.
Davis, Wesley L., 27322 Via Segundo, Mission Viejo, Calif. 92691
De Benedictis, Thomas, 7123 Kerr Drive, Springfield, Va. 22150
Di Biase, Francis M., 98 Craigie St., Portland, Maine, 04102
Dickerson, Robert W., Jr. 4145 Via Marina, Apt. 124, Marina del Rey, Calif. 90291.
Digirolamo, Samuel, 237 Timbercrest Road, Kirkwood, Mo. 63122
Donohue, John P., Jr., 10 Dogwood Lane, Collegeville, Pa. 19426
Dornfeld, Richard L., 1962 Tall Oaks Dr., Apt. 2B, Aurora, Ill. 60505
Drost, Patricia M., 14433 Golden Oak Ct., Centerville, Va. 22020
Dufault, Larry B., Box 850, New London, N.H. 03257

E

Erickson, Allen H., 2007 Douglas Drive, Schofield, Wis. 54476

F

Faulkner, David C., 59 Washington Ave., Schenectady, N.Y. 12305
Feeney, William L., 614 S. 19th St., Arlington, Va. 22202
Feng, Chung L., 16 Seven Springs Road, Radnor Pa. 19087
Fronko, Michael F., 938 Braun Ave., Belpre, Ohio 45714

G

Geringer, Margaret L., 15818 E. Market St., Warwaw, Ind. 46580
Gilroy, Hugh M., 824 Mulford, Apt. 3E, Evanston, Ill. 60202
Glenn, Wari[illegible] E. B., 822 S. Fairfax St., Alexandria, Va. 2231[illegible]
Goans, [illegible] W., 2233 Pinefield Road, Waldorf, Md. 20601
Goldber[illegible]rk, 2110 Fairlane Road, Bel Air, Md. 21014
Goldstein[illegible], 11577 Forum Way, Santa Ana, Calif. 92705
Gooding, [illegible]es L., Jr., 4921 Seminary Road, Apt. 1020, Alexandr[illegible]Va. 22311
Gordon, D[illegible]P., 1900 Lyttonsville Road, Apt. 313, Silver Spring, M[illegible]910
Gra[illegible]rek, Wi[illegible]n C., 309 E. Nebraska, Elburn, Ill. 60019
Graha[illegible], Barr[illegible], 5098 V St., NW., Washington, D.C. 20007
Gregg, John V[illegible]1618 Timber Ridge Lane, Apt. 1, Sharonville, Ohio 45[illegible]
Gregory, Willia[illegible]D., 429 Glyndon St., NE., Vienna, Va. 22180
Griffin, William[illegible], 290 Commonwealth Ave., Suite 17, Boston, Mass. 02115
Grossman, Kurt L., 2246 N. Beauregard, Apt. 24, Alexandria, Va. 22311
Guynn, Kevin W., 9612 Ivanhoe, Apt. 4, Schiller, Park, Ill. 60176

H

Hall, H. Tracy, 1711 N. Lambert Lane, Provo, Utah 84601
Hamilton, Drew S., 6918 S. 745 East, Apt. A, Midvale, Utah 84047
Hammar, John C., 3000 Greenridge Drive, Apt. 1721, Houston, Tex. 77057
Hampson, Gary T., 5716 S. Pickering Ave., Whittier, Calif. 90601

Harmon, M. Elaine, 3724 Rolliston Road, Shaker Heights, Ohio 44120
Harpman, Richard C., 2485 Timothy Knoll Drive, Poland, Ohio 44514
Harris, William M., 15736 Tuba St., Granada Hills, Calif. 91344
Heeg, Casey, 65 Olive Place, Forest Hills, N.Y. 11375
Hegna, Hans O., 127 Agate, Balboa Island, Newport Beach, Calif. 92662
Heidrich, William A., III, 24455 Lake Shore Blvd., Apt. 1114, Euclid, Ohio 44123
Heinl, Kevin J., 608 S. Woodward, Apt. 1, Birmingham, Mich. 48011
Heller, Howard E., Lansing Place, New Brunswick, N.J. 08901
Henderson, Samuel J., Old Turnpike Road, Haddam, Conn. 06438
Hierl, Michael A., 2203 Ridge Ave., Evanston, Ill. 60201
Hoel, Carlton H., 7811 SW., 147th Court, Miami, Fla. 33193
Howard, William H. F., 3339 La Mesa, Apt. 9, San Carlos, Calif. 94070

I

Ilardi, Terry J., 1155 Warburton Ave., Apt. 12V, Yonkers, N.Y. 10701

J

Jackson, Thomas H., 52 Tower Mountain Road, Bernardsville, N.J. 07924
Janiuk, Anthony J., 900 W. Belden Ave., Apt. 605, Chicago, Ill. 60614
Jensen, Robert L., 1461 Topar Ave., Los Altos, Calif. 94022
Johnson, John M., 3861 Arlington Drive, San Bernardino, Calif. 92404
Johnson, Kent R., 2 Old Colony Lane, Apt. 11, Arlington, Mass. 02174

K

Kaardal, Ivar M., 1850 West Touhy Ave., Chicago, Ill. 60626
Karas, Richard J., 216 Bavnard Road, Addison, Ill. 60101
Karn, William S., 518 Dickson Ave., Pittsburgh, Pa. 15202
Kelley, Thomas E., 412 Briarcliff Lane, Cary, N.C. 27511
Kemper, David A., 10913 Reseda Blvd., Northridge, Calif. 91326
Knauper, Emily A., 125 Warren St., Concord, N.H. 03301
Knop, Frederick L., Jr., 124 E. Oakwood Road, East Peoria, Ill. 61611
Kriman, Marianne M., 837 Carlton Road, Westfield, N.J. 07090
Krout, John C., 5108 N. 23rd Road, Arlington, Va. 22202

L

Larsen, Arthur B., 104 Heulitt Road, Colts Neck, N.J. 07722
Latham, Roy W., 249 Acalanes No. 4, Sunnyvale, Calif. 94086
Lawrence, Joan K., 2161 N. Lincoln St., Arlington, Va. 22207
Lemke, Arno W., 1814 S. Fernandez, Arlington, Hgts., Ill. 60005
Lerner, Moisey M., 1788 Beacon St., Apt. 1A, Brookline, Mass. 02146
Linek, Ernest V., 28 Koster Blvd., Apt. 2C, Edison, N.J. 08817
Litchfield, Stephen A., Route 1, Box 20A, Bartlett, Ill. 60103
Loftis, George R., P.O. Box 1602, Long Beach, Calif. 90801
Long, Benjamin E., 415 Summerhaven Drive, Columbus, Miss. 39701
Long, James D., 1724 Mayfair Drive, Birmingham, Ala. 35209
Lovercheck, Wayne L., 508 Colorado Drive, Erie, Pa. 16505
Luchs, James K., 1 Victoria Place, Holmdel, N.J. 07733
Lunn, Gregory J., 692 Peach Tree, Erlanger, Ky. 41018

M

MacDermott, Michael J., 1434 Princeton, Apt. F., Santa Monica, Calif. 90404
Macatti, Anita W., 63 Cumberland Ave., Verona, N.J. 07044
Maiorso, Thomas V., 2208 Lakeland Ave., Lakeland, Ohio 44107
Manheim, Karl M., 2321 Zeno Place, Venice, Calif. 90291
Mankovitz, Roy J., 19128 Weston Place, Tarzana, Calif. 91356
Marcoux, Thomas A., 28 Mapleleaf Lane, New Hyde Park, N.Y. 11040
Marett, Rodney L., 12433 N. 28th Drive, Apt. P–32, Phoenix, Ariz. 85029
Marshall, Charles C., 248 Washington Ave., Rutherford, N.J. 07070
Martin, Charles F., Jr., 928 S. Forrest Drive, Homewood, Ala. 35209
Maslow, James E., 300 Mercer St., Apt. 15C, New York, N.Y. 10003
Massie, Lewis T., 2218–13th St., Olivenhain, Calif. 92024
McCowin, Kathleen S., 1121 New Hampshire Ave., NW., Apt. 510, Washington, D.C. 20037
McCaffey, Thomas F., III, 412 Milford Drive, Broomall, Pa. 19008
McCrae, Charles A., 200 Pearl St., Denver, Colo. 80203
McDermott, William F., 431 Oakdale Ave., Apt. 6A, Chicago, Ill. 60657
Meagher, Thomas F., 5722 Merton Ct., Apt. 170, Alexandria, Va. 22311
Mickevicius, John K., 194 Highbury Drive, Elgin, Ill. 60120
Micklewicz, Russell D., 1408 Westchester Blvd., Westchester, Ill. 60153
Miller, Joel, 415 W. Grand St., Apt. C4, Elizabeth, N.J. 07202
Miller, S. Debra, 2028 East Mabel St., Tucson, Ariz. 85719
Molan, Robert A., 6 Niagara Lane, Commack, N.Y. 11725
Monahan, Thomas J., 8 Thomas St., Concord, N.H. 03301
Mondul, Donald D., 1638 Blackhawk Trail, Wheeling, Ill. 60090
Moore, Arthur B., 163 Irving St., Framingham, Mass. 01701
Murashige, Kate H., 1200 Cotton St., Menlo Park, Calif. 94025
Murnane, John D., 400 East 71st St., Apt. GG, New York, N.Y. 10021

N

Nalaboff, George, 3000–12 Stevens St., Oceanside, N.Y. 11572
Neyenesch, Linda R., 3006 Falcon St., San Diego, Calif. 92101

O

Olsen, Kurt C., 1665 Valley Road, Millington, N.J. 07946
O'Meara, William P., 509 S. 35th St., Omaha, Nebr. 68105
Ostrager, Glenn F., 176–12 Kildare Road, Jamaica, N.J. 11432

P

Pacher, Eugen E., 401 Rt. 22, Apt. 34B, North Plainfield, N.J. 07060
Parad, Boris, 1415 W. Greenleaf, Chicago, Ill. 60626
Parse, James G., 254 Braemar Lane, Kalamazoo, Mich. 49007
Paul, James W., 504 John St., Manhattan Beach, Calif. 90266
Penton, Joel R., Box 16420B, Baton Rouge, La. 70893
Perry, George M., 2005 Valencia Drive, Apt. 314D, Northbrook, Ill. 60062
Perry, William C., 3918 N. Wilkins Road, Peoria, Ill. 61615
Person, Sandra M., 12638 Darlenen St., Upper Marlboro, Md. 20870
Phelan, James F., 19 Rowland Drive, Prospect, Conn. 06712
Plitch, Sanford J., 344 Kings Mews, 1027 Valley Forge Road, Devon, Pa. 19333
Powell, Marvin J., 3321–B East Tuxedo Blvd., Bartlesville, Okla. 74003
Price, Frank C., 13812 Sandhurst Place, Santa Ana, Calif. 92705
Prizzi, John J., 505 Mifflin St., Duquesne, Pa. 15110

Q

Quarforth, Carl D., 3902 Oliver Ave., Annandale, Va. 22003

R

Rhoads, Kenneth A., 175 Hickory Lane-Far Hills, East Peoria, Ill. 61612
Richards, Jon W., 1540 University Village, Salt Lake City, Utah 84108
Richey, Frances, 429 N. St., SW., Apt. 807, Washington, D.C. 20024
Ring, Thomas J., 214 W. Hill St., Apt. 3, Chicago, Ill. 60610
Ritz, Dennis P., 505 Colima St., La Jolla, Calif. 92307
Rolinec, Rudolph V., 2208 Lackawanna St., Adelphia, Md. 20783
Ross, Herbert C., 215 Burgess Ave., Alexandria, Va. 22203
Rosen, Steven J., 400 Cold Spring Road, Apt. 327, Rocky Hill, Conn. 06067
Rowe, Jagner C., 1802 Berkner Drive, Richardson, Tex. 75081
Rupert, Donald W., 2519 Park Place, Evanston, Ill. 60201

S

Salasny, Gail-Deanna, 444 Saratoga Ave., Apt. 3K, Santa Clara, Calif. 95050
Sasai, Jane Y., 9932 Coffer Woods Road, Burke, Va. 22015
Schafrann, Jonathan B., 23 Butler Road, Scarsdale, N.Y. 10583
Schechtman, Melvin A., 9530 N. Lamon Place, Apt. 401, Skokie, Ill. 60077
Scherer, Jonathan L., 11 Wagon Wheel Drive, New City, N.Y. 10956
Schlesinger, Robert N., 576 Bellflower Blvd., Apt. 230, Long Beach, Calif. 90814
Schor, Kenneth M., 11175 Columbia Pike, White Oak, Silver Spring, Md. 20901
Schuurman, William G. V. E., 6231 Del Monte, Houston, Tex. 77057
Schwartz, Robert M., 1198 Venetian Way, Apt. 308, Miami Beach, Fla. 33139
Schwedler, Donald J., 1129 E. Walnut Creek Pkwy., West Covina, Calif. 91790
Scola, Daniel A., Jr., 139 Salmon Brook Drive, Glastonbury, Conn. 06033
Scott, Robert G., Box 25, Notre Dame, Ind. 46556
Seemann, Robert A., 89 Earl Ave., Hamden, Conn. 06514
Shack, Robert A., 29 Harvard Ave., Brookline, Mass. 02146
Shaffer, John N., Jr., 3702 Pipers Meadow, San Antonio, Tex. 78251
Shalier, John L., 1720 Hiner Road, Orient, Ohio 43146
Shaper, Lawrence, 85 Elm Drive, East Hills, N.Y. 11576
Sheppard, Albert S., 13610 Valerio St., Van Nuys, Calif. 91405
Shimel, Barbara A., Concord Gardens Apts., Apt. 26–2, Concord, N.H. 03301
Shreve, Marian R., 1807 Penn Ave., Apt. C, Charleston, W. Va. 25302
Skerpon, Joseph M., 168 Westfall Drive, Tonawanda, N.Y. 14150
Sleven, Marvin O., 13257 Chalon Road, Los Angeles, Calif. 90049
Smith, Alan J., 3329 Engelside Road, Shaker Heights, Ohio 44122
Sternick, Sidney, 635 Silverlake Drive, San Ramon, Calif. 94583
Striffler, Eugene, Jr., 1 Old Oak Ct., R.D., #1, Hightstown, N.J. 08520
Strugar, Daniel, 6987 Big Creek Parkway, Middleburg Heights, Ohio 44130

T

Tate, Thomas B., 2229 Burma Lane, South St. Paul, Minn. 55075
Telecky, Frederick J., Jr., 10705 Lake Ave., Cleveland, Ohio 44102

Thomas, Bradley S., 2316 Harcroft Road, Timonium, Md. 21093
Thomas, John A., 4531 Cedar Springs, Apt. 205, Dallas, Tex. 75219
Thomas, Terry R., 10240 Homage Ave., Whittier, Calif. 90604
Thompson, Alan H., 630 N. Wildwood, Glendora, Calif. 91740
Thompson, Mardi Ruth, 721 14th Ave., Prospect Park, Pa. 19076
Traynham, Wayne O., 137 S. Hall St., Manchester, N.H. 03103
Trygstad, Joan S., 12727 W. Dodge Road, Apt. 251B, Omaha, Nebr. 68154

V

Van Valkenburg, J. Wade, Jr., 494 Curfew St., St. Paul, Minn. 55104

W

Walker, Alfred M., 1 Ash Place, Great Neck Plaza, N.Y. 11021
Walter, Charles P., 9131 Timberside Drive, Houston, Tex. 77025
Wasatonic, John J., 11 Marlyn Road, Billerica, Mass. 01821
Watson, Harry J., 505 E. 17th, Apt. 24, South Sioux City, Iowa 68776
Webster, Stuart A., 26 Fernwood Drive, Rocky Hill, Conn. 06067
Weiss, David R., 301–H Mansfield St., New Haven, Conn. 06511
Weiss, Tiberiu, 75–08 184th St., Flushing, N.Y. 11366
Werfel, Gerald H., 879 N. Kentucky St., Arlington, Va. 22205
Westerman, William F., 609 W. 46th St., Apt. 904, Kansas City, Mo. 64112
Wiles, Terry L., 1411 W. 140th St., Burnsville, Minn. 55337
Wilson, Paul M., 311 S. La Salle St., Apt. 41–L, Durham, N.C. 27705
Winters, Douglas E., 8900 NE 191st Place, Bothell, Wash. 98011
Wolbrecht, Horace M., 3053 Kallin Ave., Long Beach, Calif. 90808
Wong, Edward Y., 112 E. Edith Ave., Los Altos, Calif. 94022
Wood, Craig A., 14351 Pinewood Road, Tustin, Calif. 92680
Wu, Jack Hsueh-I, 281 Urbano Drive, San Francisco, Calif. 94127
Wyrick, Milton D., 1225 Madeline, El Paso, Tex. 79902

Y

Yaggy, Leon S., 1515 Avocado Road, Oceanside, Calif. 92054
Yawney, Mary M., 623 Maryland Ave., NE., Washington, D.C. 20001

Z

Zalecki, Gregory T., 24300 Prairie Lane, Warren, Mich. 48089
Zalph, Barry L., 2209 Alabama Ave., Durham, N.C. 27705
Zirker, Daniel R., 5 W. Glebe Road, Apt. B–23, Alexandria, Va. 22305

## REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**4,089,309,** Re. S.N. 150,015, Filed May 15, 1980, Cl. 123/119 B, CRANKCASE EMISSION SEPARATOR AND COLLECTOR, Elmer W. Bush, Owner of Record: *Inventor,* Attorney or Agent: Stephen S. Townsend, et al., Ex. Gp.: 342

**4,092,182,** Re. S.N. 150,945, Filed May 19, 1980, Cl. 148/23, SOLDERING FLUX COMPOSITION, Gordon Francis Arbib, et al., Owner of Record: *Multicore Solders Limited, Hertfordshire, #P2 4RF, England,* Attorney or Agent: Alvin Frowdy, et al., Ex. Gp.: 111

**4,146,340,** Re. S.N. 151,479, Filed May 19, 1980, Cl. 403/27, CALIBRATED REPLACEMENT TORQUE ROD, Joseph E. Smith, Jr., Owner of Record: *Gulf & Western Manufacturing Company, Southfield, Mich.,* Attorney or Agent: Claude A. Patalidis, et al., Ex. Gp.: 353

**4,147,550,** Re. S.N. 148,108, Filed May 9, 1980, Cl. 430/87 A, PHOTOGRAPHIC SILVER HALIDE ELEMENT WITH A LAYER OF SULFONATED POLYMER, Gerald A. Campbell, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: J. J. Hawley, et al., Ex. Gp.: 166

**4,184,128,** Re. S.N. 147,872, Filed May 8, 1980, Cl. 331/113 A, HIGH EFFICIENCY PUSH-PULL INVERTERS, Ole K. Nilssen, Owner of Record: *Inventor,* Attorney or Agent: William E. Lucas, et al., Ex. Gp.: 252

# PATENT NOTICES

## Certificates of Correction for the Week of July 22, 1980

| | | | |
|---|---|---|---|
| Re. 30,209 | 4,175,632 | 4,190,853 | 4,196,175 |
| Re. 30,256 | 4,177,064 | 4,190,907 | 4,196,309 |
| D. 254,136 | 4,177,189 | 4,191,676 | 4,196,555 |
| 3,859,263 | 4,178,468 | 4,192,042 | 4,196,568 |
| 3,953,335 | 4,178,538 | 4,192,353 | 4,197,167 |
| 4,032,473 | 4,179,786 | 4,192,354 | 4,197,278 |
| 4,070,344 | 4,180,598 | 4,192,356 | 4,197,314 |
| 4,076,092 | 4,181,821 | 4,192,436 | 4,197,422 |
| 4,080,540 | 4,181,826 | 4,192,441 | 4,197,606 |
| 4,081,365 | 4,183,341 | 4,192,451 | 4,198,095 |
| 4,090,693 | 4,183,772 | 4,192,531 | 4,198,097 |
| 4,091,204 | 4,183,797 | 4,192,745 | 4,198,238 |
| 4,098,981 | 4,184,011 | 4,192,891 | 4,198,279 |
| 4,110,327 | 4,184,327 | 4,193,036 | 4,198,350 |
| 4,124,407 | 4,185,270 | 4,193,089 | 4,198,611 |
| 4,127,131 | 4,185,936 | 4,193,113 | 4,198,652 |
| 4,137,604 | 4,186,208 | 4,193,272 | 4,198,682 |
| 4,143,317 | 4,186,226 | 4,193,274 | 4,198,712 |
| 4,150,830 | 4,186,306 | 4,193,453 | 4,198,718 |
| 4,152,369 | 4,187,052 | 4,193,690 | 4,199,034 |
| 4,153,070 | 4,187,467 | 4,193,936 | 4,199,374 |
| 4,153,940 | 4,187,748 | 4,194,321 | 4,199,392 |
| 4,157,173 | 4,187,952 | 4,194,471 | 4,199,486 |
| 4,162,016 | 4,187,977 | 4,194,495 | 4,199,525 |
| 4,163,011 | 4,188,032 | 4,194,547 | 4,199,672 |
| 4,163,734 | 4,188,067 | 4,194,552 | 4,199,691 |
| 4,166,797 | 4,188,227 | 4,194,606 | 4,199,897 |
| 4,166,866 | 4,188,373 | 4,194,899 | 4,200,023 |
| 4,166,873 | 4,188,387 | 4,195,030 | 4,201,044 |
| 4,167,255 | 4,188,399 | 4,195,154 | 4,201,784 |
| 4,171,932 | 4,188,511 | 4,195,277 | 4,202,412 |
| 4,173,121 | 4,189,273 | 4,195,312 | 4,202,507 |
| 4,173,126 | 4,189,653 | 4,195,489 | 4,202,866 |
| 4,173,530 | 4,190,089 | 4,195,594 | 4,203,292 |
| 4,174,211 | 4,190,192 | 4,195,669 | 4,204,488 |
| 4,174,415 | 4,190,596 | 4,195,987 | 4,204,489 |
| 4,174,519 | 4,190,676 | 4,196,061 | |
| 4,175,225 | 4,190,852 | 4,196,155 | |

## Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,819,547, W. O. Pillar, R. A. Sutton SELF-EXTINGUISHING POLYMER COMPOSITIONS CONTAINING HEXABROMO-2- BUTENE, Interference No. 99,327, decided February 13, 1980, claim 6.

Patent No. 3,913,225, E. W. Tietjens, D. J. Van Hemman, DRY SHAVING APPARATUS WITH SHEAR PLATE BIASING MEANS, Interference No. 99,560, decided June 5, 1979, claims 1, 2, 5 and 7.

Patent No. 3,919,563, D. J. Lautier, L. L. Maeder, P. E. Mayer, CONTROLLABLY SELF-RELEASABLE SAFETY FASTENER AND METHOD OF UNLOCKING SAME, Interference No. 99,759, decided April 10, 1980, claims 7, 9, 11–14, 25 and 27.

Patent No. 3,922,739, I. A. Babintsev, APPARATUS FOR CONVERTING SEA WAVE ENERGY INTO ELECTRICAL ENERGY, Interference No. 99,543, decided January 28, 1980, claim 1.

Patent No. 3,934,652, C. B. Cochran, APPARATUS AND METHOD FOR CEMENTING WELL LINERS, Interference No. 99,680, decided April 9, 1980, claim 7.

Patent No. 3,937,695, D. Sarantakis, P-GLU-TRP-SER-TYR-D-LYS-LEU-ARG-PRO-GLY-NH2 AND INTERMEDIATES, Interference No. 100,096, decided April 2, 1980, claim 1.

Patent No. 3,972,285, C. H. Brown, OBJECT ARRAY PLACEMENT DEVICE, Interference No. 99, 621, decided February 29, 1980, claims 1–5, 7 and 10.

Patent No. 3,987,212, R. D. Seeley, H. J. Hartmann, D. R. Sidoti, CHOLESTEROL FREE EGG PRODUCT, Interference No. 100,123, decided April 30, 1980, claims 1–3, 6, 7, 9 and 10.

Patent No. 4,057,169, J. R. Payne, DUAL TONGUE AND SLOT CONTAINER LOCK, Interference No. 100,271, decided April 10, 1980, claims 1, 3–10.

Patent No. 4,042,417, R. Kaplow, R. I. Frank, PHOTOVOLTAIC SYSTEM INCLUDING A LENS STRUCTURE, Interference No. 100,136, decided April 14, 1980, claims 1, 2, 5 and 7.

## Disclaimers

3,969,930.—*Dusan Ciril Prevorsek, Young Doo Kwon* and *Raj Kumar Sharma*, Morristown, and *Edward T. Gilliam*, Lake Hiawatha, N.J. TESTING VISCOELASTIC SOLIDS. Patent dated July 20, 1976. Disclaimer filed Mar. 13, 1980, by the assignee, *Allied Chemical Corporation*.

Hereby enters this disclaimer to claims 1, 2, 4, 6, 8 and 19–22 of said patent.

4,072,611.—*Steven S. Davis*, Bountiful, Utah. BELT DEWRINKLING AND ALIGNMENT METHOD AND APPARATUS. Patent dated Feb. 7, 1978. Disclaimer filed Apr. 28, 1980, by the assignee, *Envirotech Corporation*.

Hereby enters this disclaimer to claim 9 of said patent.

## National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

*Notice of Availability for Licensing*

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C., 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va., 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
*Program Coordinator,*
*Office of Government Inventions and Patents,*
*National Technical Information Service,*
*U.S. Department of Commerce.*

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 6–085,453. Windscreen Angular Deviation Measurement Device. Filed Oct. 16, 1979.

Patent application 6–085,663. Near Millimeter Bistable Device. Filed Oct. 17, 1979.

Patent application 6–090,383. Measurement of Windscreen Distortion Using Optical Diffraction. Filed Nov. 1, 1979.

Patent application 6–090,384. Waveguide Line Spread Function Analyzing Apparatus. Filed Nov. 1, 1979.

Patent application 6–091,991. Feedback Display System for Microscopic Optical Instruments. Filed Nov. 7, 1979.

Patent application 6–097,594. Laser Autoalignment System. Filed Nov. 26, 1979.

Patent application 6–100,578. Chemical-Biological Agent Protective Hood. Filed Dec. 5, 1979.

Patent 4,181,435. Holographic Field Lens Detector. Filed June 29, 1973. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,181,774. Electromagnetic Interference Filter Window. Filed Dec. 19, 1978. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,185,254. Annular Laser Having Adjustable and Interchangeable Laser Windows. Filed Oct. 13, 1977. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,919. Quadrant Detection System. Filed June 8, 1973. Patented Jan. 29, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–047,172. Process for Preservation of Stored Wood Chips. Filed June 8, 1979.

Patent application 6–080,735. Control of Winged Waterprimrose and Northern Jointvetch With Fungal Pathogens. Filed Oct. 1, 1979.

Patent 4,179,446. Sex Pheromone Produced by the Female Japanese Beetle: Specificity of Male Response to Enantioners. Filed Aug. 8, 1978. Patented Dec. 18, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW. Washington, D.C. 20240

Patent application 6–066,999. Extensometer Anchor. Filed Aug. 16, 1979.

Patent application 6–072,955. Electrodeposition of Lead. Filed Sept. 6, 1979.

Patent application 6–072,956. Electrolytic Stripping Cell. Filed Sept. 6, 1979.

Patent application 6–072,957. Removal of Impurities From Clay. Filed Sept. 6, 1979.

Patent application 6–080,824. Recovery of Alumina From Clay. Filed Oct. 1, 1979.

Patent application 6–081,505. Passive Explosion Barrier for Mines. Filed Oct. 3, 1979.

Patent application 6–081,506. Dust Controlling Method Using a Coal Cutter Bit. Filed Oct. 3, 1979.

Patent application 6–082,383. Improved Discriminating Circuit Breaker Protection System for Direct Current Power Distribution Systems. Filed Oct. 5, 1979.

Patent 4,170,415. System for Producing Orthophotographs. Filed July 15, 1977. Patented Oct. 9, 1979. Not available NTIS.

Patent 4,170,668. Method for Wood Precharring. Filed Sept. 15, 1978. Patented Oct. 9, 1979. Not available NTIS.

Patent 4,172,255. HF Coastal Current Mapping Radar System. Filed Aug. 8, 1977. Patented Oct. 23, 1979. Not available NTIS.

Patent 4,173,140. Trigger Device for Explosion Barrier. Filed Feb. 3, 1978. Patented Nov. 6, 1979. Not available NTIS.

Patent 4,174,966. High Coercive Force Rare Earth Metal-Cobalt Magnets Containing Copper and Magnesium. Filed Dec. 15, 1978. Patented Nov. 20, 1979. Not available NTIS.

Patent 4,180,628. Resin for Sorption of Tungsten. Filed July 18, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,181,630. Catalyst for Synthesis of Methanol. Filed Nov. 30, 1978. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,184,884. Process for Producing a Metastable Precursor Powder and for Producing Sialon From This Powder. Filed Oct. 23, 1978. Patented Jan. 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 6–072,820. Frustrated Total Internal Reflection Fiber-Optic Small-Motion Sensor for Hydrophone Use. Filed Sept. 4, 1979.

Patent application 6–087,270. Apparatus and Process for Determining the Composition of Fluid-Filled Cavities. Filed Oct. 22, 1979.

Patent 4,166,694. Method for Optically Distorting Readout Reticles. Filed Mar. 28, 1978. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,176,339. Propagation Sampled Acoustic Line Array. Filed Feb. 2, 1978. Patented Nov. 27, 1979. Not available NTIS.

Patent 4,176,919. Passive High-Speed Automatic Shutter for Imaging Devices. Filed Jan. 31, 1978. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,178,577. Low Frequency Hydrophone. Filed Feb. 6, 1978. Patented Dec. 11, 1979. Not available NTIS.

TENNESSEE VALLEY AUTHORITY

Division of Law, Muscle Shoals, Ala. 35660

Patent 4,180,545. Uranium Recovery From Wet-Process Phosphoric Acid. Filed Aug. 25, 1977. Patented Dec. 25, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent 4,040,940. Electrophoretic Fractional Elution Apparatus Employing a Rotational Seal Fraction Collector. Filed Dec. 21, 1976. Patented Aug. 9, 1977. Not available NTIS.

Patent 4,158,775. High Resolution Threshold Photoelectron Spectroscopy by Electron Attachment. Filed Nov. 30, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,164,718. Electromagnetic Power Absorber. Filed Sept. 15, 1977. Patented Aug. 14, 1979. Not available NTIS.

Patent 4,172,883. Method of Purifying Metallurgical Grade Silicon Employing Reduced Pressure Atmospheric Control. Filed June 23, 1978. Patented Oct. 30, 1979. Not available NTIS.

Patent 4,176,360. Antenna Deployment Mechanism for Use With a Spacecraft. Filed Sept. 18, 1978. Patented Nov. 27, 1979. Not available NTIS.

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| California | Los Angeles Public Library | (213) 626–7555 Ext. 274 |
| | Sacramento: California State Library | (916) 322–4572 |
| | Sunnyvale Patent Library* | (408) 736-0795 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 223 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2814 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1458 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Love Library | (404) 472-3411 |
| New Jersey | Newark Public Library | (201) 733-7740 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 790-6291 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County Public Library | (513) 369-6969 |
| | Cleveland Public Library | (216) 623-2932 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 242–7361 Ext. 258 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1226 |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3128 |
| | University Park: The Pennsylvania State Libraries | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 224 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF JUNE 14, 1980

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 6-18-79 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 4-2-79 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 7-5-79 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 10-15-79 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 6-27-79 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 12-11-78 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 1-31-79 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 5-1-79 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 10-10-78 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 9-18-78 |
| DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts. | 6-12-78 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 2-2-79 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 5-17-79 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 5-11-79 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 11-22-79 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-1-79 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during June 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,091,768 to 3,095,571, inclusive
Plant Patents..... Numbers 2,262 to 2,268, inclusive

# REISSUE PATENTS

## GRANTED JUL. 22, 1980

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 433–126 | 30,340 |
| 081–009.5 B | 30,342 |
| 272–065 | 30,344 |

# REISSUES

JULY 22, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

## Re. 30,340
## DENTAL HANDPIECE

John V. Borden, 3815 Chanel Rd., Annandale, Va. 22003

Original No. 3,324,553, dated Jun. 13, 1967, Ser. No. 679,552, Aug. 22, 1957. Continuation-in-part of Ser. No. 634,860, Jan. 18, 1957, abandoned. Application for reissue Nov. 9, 1978, Ser. No. 959,435

Int. Cl.² A61C *1/10*

U.S. Cl. 433—126 56 Claims

1. A high speed dental handpiece comprising a housing having opposite ends provided with fluid discharge means therein, a shaft within said housing extending between said opposite ends thereof, means on one end of said shaft to connect a dental tool thereto, a rotor carried by said shaft between the opposite ends thereof, bearings having anti-friction members movable therein and supported within said housing to support rotatably said shaft respectively adjacent opposite ends of said rotor, each of said bearings having an opening therethrough, impeller means on said rotor extending generally axially of said rotor and terminating adjacent the opposite ends thereof, means to direct gaseous fluid under pressure against said impeller means to rotate said rotor, and means on said rotor operable to discharge driving gaseous fluid in opposite directions directly from said impeller means and through said openings in each of said bearings for exhaust from said housing through said discharge means in said opposite ends thereof.

---

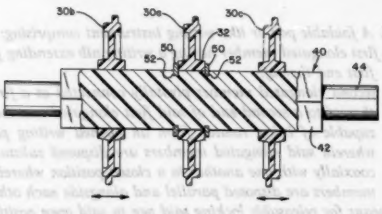
## Re. 30,341
## CONVEYOR DRIVE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Original No. 3,724,285, dated Apr. 3, 1973, Ser. No. 244,773, Apr. 17, 1972. Application for reissue Jun. 22, 1978, Ser. No. 918,329

Int. Cl.² F16H *55/30*

U.S. Cl. 198—834 17 Claims




1. A sprocket and drive shaft assembly for a chain link conveyor belt subject to variations in width comprising, in combination:

a drive shaft with a substantially uniform, noncircular cross section; and

a plurality of sprockets mounted in driven engagement on said shaft for supporting and driving a conveyor belt; one of said sprockets being releasably locked against axial motion to provide for proper belt tracking, all other of said sprockets being free to move axially.

---

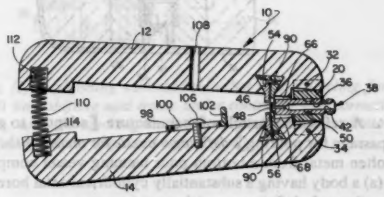
## Re. 30,342
## WIRE STRIPPER HAVING REPLACEABLE BLADES

Joseph A. Perrino, Rehoboth, Mass., assignor to Micro Electronics, Inc., Rehoboth, Mass.

Original No. 4,108,028, dated Aug. 22, 1978, Ser. No. 770,984, Feb. 22, 1977. Application for reissue May 3, 1979, Ser. No. 35,555

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 B 3 Claims




1. A device for stripping insulation from relatively small diameter electrical wire, comprising a pair of hand-held elongated grip members, means for pivotally interconnecting said grip members at one end thereof, the other ends of said grip members being movable relative to each other to provide for the pivotal movement of said members to and from a closed stripping position thereof, an elongated tubular guide located in said interconnecting means intermediate the said grip members and receiving therein in guiding relation the lead-in portion of a wire from which insulation is to be stripped, a reduced projection formed on the innermost end of said tubular guide, each of said grip members having a laterally extending slot formed therein, opposed blade assemblies removably secured in the slots in said grip members for movement with said grip members to the closed position thereof, each of said blade assemblies including an inner and outer holder element having flat opposed faces, a flat blade element located between the flat opposed faces of the holder elements in sandwiched relation and having a cutting edge in which a notch is formed, wherein the opposed blades in the closed stripping position define an opening of predetermined size for receiving the wire from which insulation is to be stripped, each of said holder elements having a circular notch formed therein that is aligned with the notch in the adjacent blade element, [the diameter of the notch in said outer holder element being greater than the diameter of the notch in said inner holder element,] the notches in the outer holder element of both blade assemblies forming an opening when the grip members are moved to the closed stripping position, the size of which is just slightly larger than that of said reduced projection, so that the reduced projection is received in snug-fitting relation between the notches of the outer holder elements, thereby axially aligning said tubular guide and wire extending therethrough and centering said wire for engagement by said blade elements during the severing of the wire insulation during said stripping operation, whereafter a longitudinal retracting movement of said wire will strip the insulation from the lead-in portion thereof that has been threaded through said tubular guide.

**Re. 30,343**

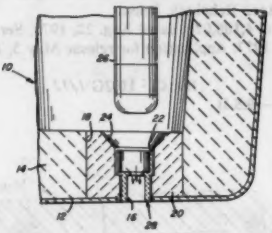
## METHOD AND SINGLE PIECE ANNULAR NOZZLE TO PREVENT ALUMINA BUILDUP DURING CONTINUOUS CASTING OF Al-KILLED STEEL

**Eugene A. Golas, Middle Township, Bucks County, and Shri N. Singh, Penn Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.**

**Original No. 4,117,959, dated Oct. 3, 1978, Ser. No. 794,290, May 5, 1977. Continuation-in-part of Ser. No. 715,603, Aug. 18, 1976, abandoned. Application for reissue Mar. 16, 1979, Ser. No. 21,147**

**Int. Cl.**[2] **B22D** *41/08*

**U.S. Cl. 222—590** **17 Claims**



2. A refractory article of manufacture [adapted to provide a passage for pouring] *defining a nozzle for metering the flow of* molten metal from a bottom pour teeming vessel comprising:

(a) a body having a substantially cylindrical axial bore therethrough defining a metal pour passage;

(b) a disc-like member having a planar upper surface extending substantially perpendicular to the axis of said bore;

(c) an axial opening through the planar surface of said member of a diameter less than the diameter of said bore to define a flow control orifice; and

(d) said disc-like member having an axial thickness no greater than about twice the diameter of said orifice and having said upper surface axially spaced from the inlet end of said bore to define a bore portion upstream of said orifice formed of a depth-to-diameter dimensional ratio operative to define a region of flow stagnation capable of damping turbulent fluctuations in said vessel to stabilize the flow stream through said orifice.

---

**Re. 30,344**

## ROUND TRAMPOLINE

**Harold L. McNeil, Tallahassee, Fla., assignor to Temple Baptist Church, Tallahassee, Fla., a part interest**

**Original No. 3,948,515, dated Apr. 6, 1976, Ser. No. 457,555, Apr. 3, 1974. Application for reissue Apr. 4, 1978, Ser. No. 893,350**

**Int. Cl.**[2] **A63B** *5/00*

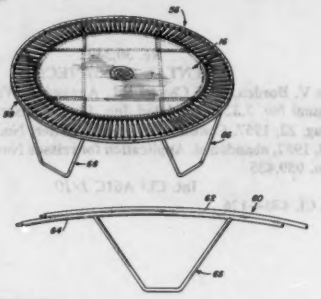
**U.S. Cl. 272—65** **7 Claims**

1. A round trampoline, comprising, in combination:

a. a sectional, substantially circular frame, the frame including a plurality of sections each formed by a pair of arcuate rails connected together to form a double rail, one of the rails staggered with respect to the other of the rails in order to form a staggered joint with an adjoining frame section and to lock the joint and prevent rotation or flexation of the adjoining sections;

b. leg means provided on the sections of the frame for supporting the frame on a support surface;

c. fastener means connecting the sections of the frame together;



d. a mat; and

e. resilient means for connecting the mat to the frame.

---

**Re. 30,345**

**Patent Not Issued For This Number**

---

**Re. 30,346**

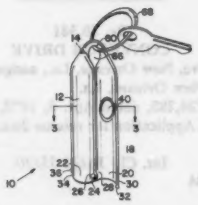
## FOLDABLE PEN

**Michael C. Klaber, 10526 Caminito Obra, San Diego, Calif. 92126**

**Original No. 4,081,217, dated Mar. 28, 1978, Ser. No. 726,471, Sep. 27, 1976. Application for reissue May 24, 1979, Ser. No. 42,069**

**Int. Cl.**[2] **B43K** *23/02, 29/00*

**U.S. Cl. 401—131** **6 Claims**



*6. A foldable pen or like writing instrument comprising:*

*a first elongated member having a writing nib extending from a first end thereof;*

*a second elongated member pivotally connected at a first end thereof to a second end of said first elongated member and capable of being rotated from an opened writing position wherein said elongated members are disposed substantially coaxially with one another to a closed position wherein said members are disposed parallel and alongside each other;*

*means for releasable locking said pen in said open position,*

*means for releasably locking said pen in said closed position; and*

*an extension projecting laterally from said second end of said second elongated member toward the location of the first end of said first elongated member when the foldable pen is in the closed position, said extension having means for contacting with said first end leaving a gap large enough to be engaged*

Re. 30,347

## CORRECTIONS FOR SEISMIC DATA OBTAINED FROM EXPANDING-SPREAD

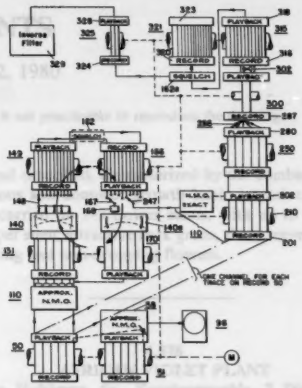
Albert W. Musgrave, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 3,697,939, dated Oct. 10, 1972, Ser. No. 101,776, Dec. 28, 1970. Continuation of Ser. No. 496,735, Sep. 30, 1965, abandoned, which is a continuation-in-part of Ser. No. 95,111, Mar. 13, 1961, abandoned. Application for reissue Jul. 14, 1977, Ser. No. 815,518

Int. Cl.[2] G01V *1/36*

U.S. Cl. 367—51 48 Claims

*49. The method of dynamically time correcting seismic traces comprised of expanded spread data with a correcting function, the values of which are determined by the velocities of the earth formations traversed by reflected energy from a multiplicity of subsurface bedding planes comprising the steps of (1) applying time shifts by a keyring between said first and second members whereby the projecting extension, the first member and the second member form a closed loop around said gap which may be interlocked with said keyring.*



*to each set of reflected energies along hyperbolic-like sweeping functions, (2) adding the reflected energies along each of said functions to obtain a maximum value, each maximum value being related uniquely to one of said sweeping functions and to a specific velocity, (3) establishing with said velocities said correcting function, (4) time shifting said traces under control of said correcting function, and (5) stacking said time-shifted traces to obtain a single trace with an enhanced signal to raise ratio.*

# PLANT PATENTS

## GRANTED JULY 22, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,576**

**ROSE PLANT**

**William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.**

**Filed Mar. 12, 1979, Ser. No. 19,311**

**Int. Cl.[2] A01H** *5/00*

**U.S. Cl. Plt.—20** **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very vigorous, well branched, upright habit of growth, its primarily Signal Red flower color, blooms of 35 to 40 petals, and its very slight fragrance.

---

**4,577**

**AFRICAN VIOLET PLANT**

**Hermann Holtkamp, Sr., Kueningsmuehle, 2 Dingden, 4236 Hamminkeln, Fed. Rep. of Germany**

**Filed Mar. 23, 1979, Ser. No. 23,473**

**Int. Cl.[2] A01H** *5/00*

**U.S. Cl. Plt.—69** **1 Claim**

1. A new and distinct cultivar of African violet plant as shown and described, characterized by the combined features of vigorous and compact growth habit; intensive blue-violet flowers carried on 7–9 flower stems, with up to 12 or more flowers per stem; attractive dark green, shiny leaves, and by its long lasting and non-dropping flowers.

---

**4,578**

**AFRICAN VIOLET PLANT**

**Hermann Holtkamp, Sr., Kueningsmuehle, 2 Dingden, 4236 Hamminkeln, Fed. Rep. of Germany**

**Filed Mar. 23, 1979, Ser. No. 23,474**

**Int. Cl.[2] A01H** *5/00*

**U.S. Cl. Plt.—69** **1 Claim**

1. A new and distinct cultivar of African violet as shown and described, characterized by the combined features of vigorous growth habit; strong and upright flower stems, each carrying 7–9 large single star-shaped purple-violet flowers; prominent bright yellow anther cells, and by its round to heart-shaped leaves carried on strong petioles.

# PLANT PATENTS

## GRANTED JULY 22, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawings

---

4,676
ROSE PLANT
William A. Warriner, Visalia, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.
Filed Mar. 15, 1979, Ser. No. 19,211
Int. Cl.? A01H 1/00
U.S. Cl. PP.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very vigorous, well branched, upright habit of growth, its prolific Signal Red flower color, blooms of 22 to 40 petals and its very slight fragrance.

---

4,677
AFRICAN VIOLET PLANT
Hermann Holtkamp, Sr., Kronbergerstraße 2 Dieplen, 4236 Hamminkeln, Fed. Rep. of Germany
Filed Mar. 23, 1979, Ser. No. 23,673
Int. Cl.? A01H 3/00
U.S. Cl. PP.—49 1 Claim

1. A new and distinct cultivar of African violet plant as shown and described, characterized by the combined features of vigorous and compact growth habit, massive blue-violet flowers carried on 2–3 flower stems, with up to 12 or more flowers per stem, attractive dark green, shiny leaves, and by its long lasting and non-dropping flowers.

---

4,678
AFRICAN VIOLET PLANT
Hermann Holtkamp, Sr., Kronbergerstraße 2 Dieplen, 4236 Hamminkeln, Fed. Rep. of Germany
Filed Mar. 23, 1979, Ser. No. 23,674
Int. Cl.? A01H 3/00
U.S. Cl. PP.—49 1 Claim

1. A new and distinct cultivar of African violet plant as shown and described, characterized by the combined features of vigorous and compact growth habit, massive blue-violet flowers carried on 2–3 large single stamineal purple-violet flowers, attractive bright yellow anther cells, and by its round to heart-shaped leaves carried on strong petioles.

# PATENTS

## GRANTED JUL. 22, 1980

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 433–126 | 4,213,243 |
| 368–263 | 4,213,291 |
| 368–204 | 4,213,292 |
| 368–152 | 4,213,293 |
| 368–082 | 4,213,294 |
| 368–236 | 4,213,295 |
| 082–001 C | 4,213,354 |
| 410–064 | 4,213,590 |
| 206–045.14 | 4,213,598 |
| 355–077 | 4,213,698 |
| 430–432 | 4,213,782 |
| 430–533 | 4,213,783 |
| 430–616 | 4,213,784 |
| 435–291 | 4,213,825 |
| 430–114 | 4,213,872 |
| 548–250 | 4,213,903 |
| 556–419 | 4,213,914 |
| 568–424 | 4,213,920 |
| 568–455 | 4,213,921 |
| 370–031 | 4,214,123 |
| 375–114 | 4,214,124 |
| 370–112 | 4,214,128 |
| 370–057 | 4,214,129 |
| 362–311 | 4,214,168 |
| 455–020 | 4,214,205 |
| 374–004 | 4,214,206 |
| 455–095 | 4,214,207 |
| 455–001 | 4,214,208 |
| 375–001 | 4,214,209 |
| 455–282 | 4,214,210 |
| 455–287 | 4,214,211 |
| 455–190 | 4,214,212 |
| 367–027 | 4,214,226 |
| 371–040 | 4,214,228 |
| 357–044 | 4,214,315 |

# PATENTS

## GRANTED JUL. 22, 1980

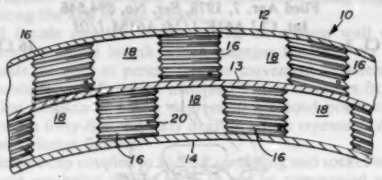
### ERRATA

# PATENTS

## GRANTED JULY 22, 1980

## GENERAL AND MECHANICAL

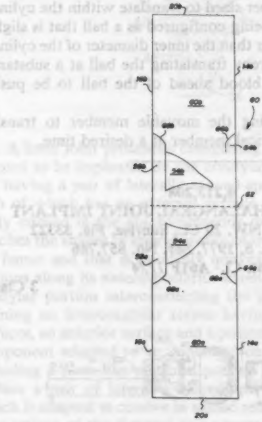
**4,213,202**
**SHOCK DISTRIBUTING PANEL**
**Ronald G. Larry, 2426 Mulberry, Bloomfield Hills, Mich. 48013**
**Filed Mar. 2, 1979, Ser. No. 16,880**
**Int. Cl.[2] A41D *13/00***
**U.S. Cl. 2—2** **9 Claims**




1. A shock distributing panel comprising:
an outer flexible sheet;
an inner flexible sheet spaced from the outer sheet;
a center flexible sheet disposed between the inner sheet and the outer sheet;
a plurality of shock distributing bellows disposed between the outer sheet and the center sheet, and between the inner sheet and the center sheet, the bellows between the outer and center sheets being laterally spaced apart from the bellows between the inner and center sheets in alternate rows and the bellows in each row being spaced apart from each other, thereby forming a void between bellows.

---

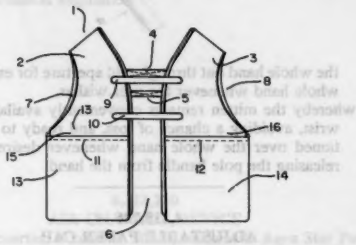
**4,213,203**
**WOMAN'S OUTER GARMENT AND PATTERN THEREFOR**
**Willa Dean L. Ratliff, 2838 Linhaven Dr., Mesquite, Tex. 75150**
**Filed Oct. 31, 1977, Ser. No. 847,269**
**Int. Cl.[2] A41D *1/06***
**U.S. Cl. 2—79** **8 Claims**



1. A garment, comprising:
a single garment piece forming first and second, mirror-image halves of the bodice portion and lower garment portion of the garment said first and second mirror-image halves forming the left and right side sections, respectively, of said garment;
the bodice portion defined by said garment piece having arm openings and a neck opening defined by substantially all of the front edge of the bodice portion of said mirror-image halves.

---

**4,213,204**
**RESCUE VEST FOR NEW-BORN BABIES**
**Frances M. Donlon, 9200 Peabody St., and Jerry H. Van Buskirk, 8015 Urbanna Rd., both of Manassas, Va. 22110**
**Filed Jul. 23, 1979, Ser. No. 59,491**
**Int. Cl.[2] A41D *1/00, 1/04***
**U.S. Cl. 2—94** **3 Claims**




1. A wrap-around garment in the form of a vest which may be readily donned to provide safe and secure protection during rapid evacuation of a plurality of new-born babies from a nursery in the event of an emergency, such as fire, comprising;
a pair of above knee length spaced unitary panels, joined at the upper back, inwardly extending edges thereof, by a plurality of fabric straps attached thereto, and defining a space between the two panels, to adapt the garment to fit adults of varying size and stature,
each panel having on its upper mid-section an opening to receive an arm of the wearer, thereby leaving the arms of the wearer free and unencumbered for other duties,
a plurality of fabric straps attached to the front upper leading edge of one of the panels, the opposite panel having fastening means on its upper front leading edge to temporarily but firmly secure said straps to maintain the garment in position on the wearer, and,
each panel having secured by stitching at a point below the base of the armhole, an elongated fabric pocket, open at the upper end, and of a size sufficient to accomodate at least two new-born babies wrapped in crib blankets, the pockets being so located on the panels as to afford proper balance and weight distribution, and to insure safe handling of the babies without bumping by the knees of the wearer during hasty evacuation.

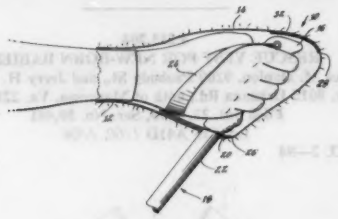
---

**4,213,205**
**SKI MITTEN**
**Nancy O. Smith, 191 Hill Brook La., Fairfield, Conn. 06430**
**Filed Aug. 11, 1978, Ser. No. 933,096**
**Int. Cl.[2] A41D *19/00*; A14D *13/08***
**U.S. Cl. 2—161 A** **9 Claims**

1. A ski mitten comprising:
a cuff of flexible material for encircling the wrist,
a thumbless enclosure of flexible hand-protecting material extending forwardly from said cuff having a rounded configuration of sufficient size to enclose the whole hand when the hand is grasping the handle of a ski pole,
said enclosure having an aperture in the bottom for permitting the shank of the ski pole to extend out of the bottom of the mitten while the pole handle is being held in normal

position for use during skiing with the shank of the pole extending downwardly and rearwardly relative to the hand and wrist of the user, and

the flexible material surrounding said aperture being sufficiently flexible and stretchable for enabling the mitten to be retracted into a position over the wrist by projecting



the whole hand out through said aperture for exposing the whole hand whenever the user wishes,

whereby the mitten remains conveniently available on the wrist, avoiding a chance of loss, and ready to be repositioned over the whole hand whenever desired without releasing the pole handle from the hand.

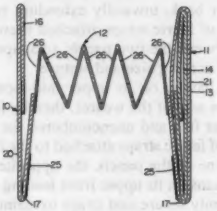
---

**4,213,206**

## ADJUSTABLE PAPER CAP

**Thomas P. Maney, 535 Greenglade Ave., Worthington, Ohio 43085**

**Filed Feb. 7, 1979, Ser. No. 10,012**
**Int. Cl.[2] A42B 1/00, 1/22**
**U.S. Cl. 2—197** **5 Claims**



1. An adjustable cap comprising

first and second elongated side panels with respective opposite ends adapted to be disposed in co-extensive relationship with each panel having opposed upper and lower longitudinally extending edges, each of said first and second panels having a marginal edge portion at each longitudinally extending edge folded relatively inwardly thereof into superimposed relationship between two said panels, said upper and lower marginal edge portions overlapping with the lower edge portion projecting a distance upwardly to partially cover the upper edge portion,

said second panel being formed with a front section and a rear section extending in longitudinally aligned overlapping relationship, with adjacent ends of the front and rear sections telescopically interconnected to permit relative longitudinal displacement thereof for selective size adjustment, said interconnection having the overlapping marginal edge portions of the rear section telescopically positioned interiorly to the overlapping marginal edge portions of the front section, each of said front and rear sections having their opposite ends connecting with a respective end of said first panel, and

an elongated crown formed from flexible sheet material and having a plurality of longitudinally extending pleated panels with an outermost pleat panel at each side thereof projecting downwardly and secured to an inwardly facing surface of a respective lower marginal edge portion of said first and second panel, said pleated panels disposed in coplanar relationship to said side panels when said crown is collapsed to a fully folded configuration.

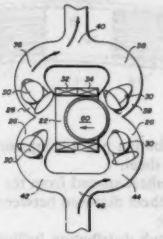
---

**4,213,207**

## ARTIFICIAL HEART AND METHOD OF PUMPING BLOOD

**Frederick M. Wilson, 2308 Lakeside Dr., Arlington, Tex. 76013**

**Filed Apr. 7, 1978, Ser. No. 894,546**
**Int. Cl.[2] A61F 1/24; A61M 1/03**
**U.S. Cl. 3—1.7** **16 Claims**



1. A construction having utility as a replacement for one chamber of a human heart, comprising:

(a) a hollow and firm cylindrical member of non-magnetic material having a length of more than one inch, with the two ends of the cylindrical member being closed, and there being an inlet port and an outlet port at each end of the cylindrical member;

(b) a check valve mounted in association with each of the ports, with one of the check valves at each end being oriented so as to admit blood to the cylindrical member in response to a low pressure therein, and the other check valve at a given end of the cylindrical member being oriented to discharge blood from the cylindrical member in response to a high pressure therein;

(c) a movable member sized to translate within the cylindrical member and being configured as a ball that is slightly smaller in diameter than the inner diameter of the cylindrical member, whereby translating the ball at a substantial speed will cause blood ahead of the ball to be pushed forwardly; and

(d) means for causing the movable member to translate within the cylindrical member at a desired time.

---

**4,213,208**

## METATARSO-PHALANGEAL JOINT IMPLANT

**Sheldon Marne, 10631 NW. 29 Ct., Sunrise, Fla. 33322**

**Filed Dec. 5, 1977, Ser. No. 857,786**
**Int. Cl.[2] A61F 1/24**
**U.S. Cl. 3—1.91** **3 Claims**

1. A metatarso-phalangeal joint prosthesis comprising;

a male joint member, said male joint member including a medullary shaft, a stem integrally connected to said shaft and a metallic cylinder coupled to said stem, said stem and shaft consisting of a tissue-inert material, a portion of said stem being embedded within said cylinder, said embedded portion within said cylinder having and forming recessed

walls within said cylinder, said shaft and stem longitudinal axis intersecting the longitudinal axis of said cylinder;

a female member, said female member having a medullary shaft disposed adjacent one end and integrally formed therein at the opposite end a socket, said socket having a partially cylindrical wall of a predetermined arcuate length, said socket being sized to receive said cylindrical head of said male member, said female member medullary shaft having a longitudinal axis that intersects the axis of said socket, said socket including at least one inwardly disposed protuberance, said protuberance being aligned along the axis of said socket;

said female member socket having an arcuate wall of a predetermined length which engages the stem on said male member to permit relative movement between the medullary shafts of the male and female members from a first position of ninety degrees to a second position between forty-five and sixty degrees which represents dorsi and plantar flexion;

a flexible cap coupled to and encapsulating said socket body, said cap being shaped so as to not be compressed while there is stress upon the joint in dorsi flexion, said cap being aligned with the stem and axis of rotation of the joint when connected; and

said medullary shafts including at least one flange to prevent rotation of said joint.

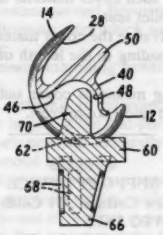
---

**4,213,209**

## KNEE JOINT PROSTHESIS

**John N. Insall, New York, N.Y., and Peter S. Walker, Ridgewood, N.J., assignors to New York Society for the Relief of the Ruptured and Crippled, New York, N.Y.**

**Filed May 22, 1978, Ser. No. 908,130**
**Int. Cl.[2] A61F *1/24***
**U.S. Cl. 3—1.911** **4 Claims**




1. A knee joint prosthesis comprising a femoral component adapted to be implanted on the condylar portion of the femur and having a pair of laterally spaced-apart condylar portions, each of which has an external surface that is smoothly convexly curved in the antero-posterior direction and generally matches the shapes in lateral profile of the condylar surfaces of the femur and that is smoothly convexly curved in all cross sections along its antero-posterior extent, and a box-like intercondylar portion interconnecting the condylar portions and defining an intercondylar recess having spaced-apart lateral surfaces, an anterior surface and a posterior surface; and a tibial component adapted to be implanted on the tibial plateau and including a plate-like platform portion having on its superior surface a pair of laterally spaced-apart concavities, each of which is adapted to receive in nested relation one of the condylar portions of the femoral component, and a post extending superiorly from the platform portion which is adapted to be received in the intercondylar recess of the femoral component, the post having lateral surfaces, an anterior surface and a posterior surface, the relative positions and shapes of the anterior surfaces of the post and recess of the prosthesis as implanted in the knee joint being such that when the leg is at and near full extension and the femur tends to dislocate posteriorly relative to the tibia, the anterior surfaces engage each other to prevent posterial dislocation of the femoral component and when the leg is partly flexed the anterior surfaces are spaced from each other and permit relatively free relative antero-posterior translation of the components but restraining excessive anterior and posterior movements, the relative positions and shapes of the posterior surfaces of the post and recess of the prosthesis as implanted in the knee joint being such that when the leg approaches full flexure and the femur tends to dislocate anteriorly, the posterior surfaces engage each other to prevent anterial dislocation of the femoral component and when the leg is partly flexed or is extended the posterior surfaces are spaced-apart and permit essentially free, relative antero-posterior translation of the components, and the adjacent lateral surfaces of the post and recess diverging superiorly relative to the platform portion of the tibial component to permit essentially free normal lateral angulation.

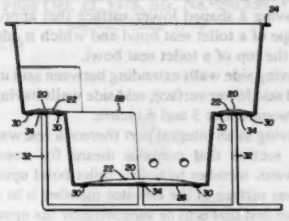
---

**4,213,210**

## AIR CHANNEL DEVICE

**Chris N. Scourtes, Westland, Mich., assignor to Aqua Star Pool Company, Westland, Mich.**

**Filed May 21, 1979, Ser. No. 40,814**
**Int. Cl.[3] A47K *3/00*; A61H *33/02***
**U.S. Cl. 4—543** **3 Claims**




1. In a bath unit which includes a base, said base having at least one interior surface formed therein on which a user may sit or rest his feet, the improvement comprising:

a flexible mat mounted on said interior surface, said mat having a plurality of perforations therein to permit the entry of air into a liquid in said base for aerating said liquid;

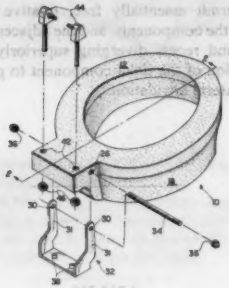
said mat mounted on said interior surface by retainer means, said retainer means securing the periphery of said mat to said interior surface, said retainer means including a bottom retainer portion and a top snap portion, said bottom retainer portion integrally mounted to said interior surface around the periphery of said mat, said mat stretched across said bottom retainer portion, and said top snap portion fitted onto said bottom retainer portion with said mat interposed therebetween thereby sealing the periphery of said mat to said interior surface; and

means for blowing air into said bath unit through a sealed opening in said interior surface, said sealed opening being beneath said mat, said air escaping into said liquid through said perforations in said mat, and said interior surface of said bath unit and said mat forming an air channel for providing a cushioning effect to said user due to the air which is compressed between said mat and said interior surface.

## 4,213,211
## TOILET SEAT ELEVATOR DEVICE

Richard A. Bemis, and John E. Rummele, both of Sheboygan, Wis., assignors to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Sep. 15, 1976, Ser. No. 723,381
Int. Cl.[2] A47K *13/06, 13/12*
U.S. Cl. 4—239 1 Claim

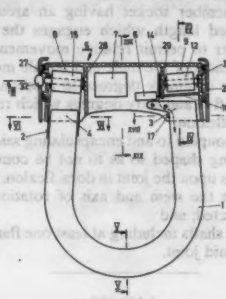


1. A toilet seat elevator assembly comprising in combination
(A) a generally ring-shaped tubular elevator member:
(1) having a shaped upper surface that in plan view approximates the shape of a toilet seat and which is adapted to support a toilet seat thereon,
(2) having a shaped lower surface that approximates the shape of a toilet seat bowl and which is adapted to rest on the top of a toilet seat bowl,
(3) having side walls extending between said upper surface and said lower surface, said side walls having a height of between about 3 and 6 inches,
(4) having as an integral part thereof a rearwardly extending section that contains means for connecting said elevator member to both a toilet bowl upon which the lower surface of the elevator member is to rest and to a toilet seat that is to be supported by the upper surface of the elevator member, said means including an elongated passageway extending completely through said rearwardly extending section,
(B) connector means for connecting said elevator member to a toilet bowl, said connector means including
(1) a flat horizontally disposed section of metal having two spaced apart holes therein which are spaced apart the same distance as the standard distance between the openings in the toilet bowl through which seat bolts are normally passed,
(2) a cantilevered leaf extending vertically upward and forwardly from each end of said flat horizontally disposed section of metal, each of said leaves having a hole in the upper portion thereof, said holes being horizontally aligned with each other along a line which is in front of the forward edge of said flat horizontally disposed section of metal, and
(C) an elongated bolt extending through the elongated passageway set forth in (A)(4) and through the horizontally aligned holes of the forwardly cantilevered leaves set forth in (B)(2),
whereby when said elevator member is attached to a toilet bowl by said connector means said elevator member can be pivoted from a substantially horizontal "down" position through an arc exceeding 90° to a generally vertical "up" position.

## 4,213,212
## ARRANGEMENT FOR FITTING AND CHANGING A TUBULAR COVER MADE OF PLASTIC FILM ON A TOILET SEAT, AND METHOD FOR FORMING A TUBE

Beis Hefty, Sursee, and Arpad Hefty, Manensee, both of Switzerland, assignors to Hygomat AG, Switzerland

Filed Aug. 31, 1978, Ser. No. 938,351
Claims priority, application Switzerland, Sep. 7, 1977, 10935/77; Nov. 4, 1977, 13426/77
Int. Cl.[2] A47K *13/14, 13/20, 13/22*
U.S. Cl. 4—243 21 Claims

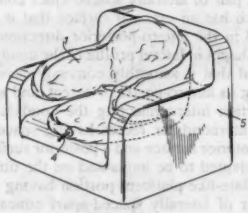


1. A device for supplying a tubular cover on a toilet seat comprising
a toilet seat having gap means through which the tubular cover is passed to encircle the body of the toilet seat,
reel means to store a length of tubular cover material, said reel means comprising a storage reel of unused tubular cover material located at the back end of the toilet seat,
a take-up reel for used cover material which has passed the length of the toilet seat,
drive means to advance the cover material a predetermined length corresponding to the length of the toilet seat covered; and
protective housing means to cover said drive means, said storage reel and said take-off reel.

## 4,213,213
## SUPPORT DEVICE

John S. Burnett, "New Cottage", 51 Coldharbour La., Bushey, Herts., England (WD2 3NU)

Filed Aug. 11, 1978, Ser. No. 932,956
Int. Cl.[2] A47C *3/00*
U.S. Cl. 5—450 6 Claims



1. A device for supporting a human body in a chair, comrpising
(a) a hollow airtight bag member having a generally cruciform configuration;
(b) a particulate material arranged within said bag member; and
(c) means for controlling the degree of inflation of said bag member between a flexible partially inflated condition and

a rigid deflated condition, whereby when said bag is partially inflated, said particulate material is distributed within said bag member to conform with the configuration of the body being supported, and when said bag member is deflated, said bag member and said particulate material rigidly support the body in a chair.

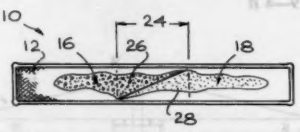
---

**4,213,214**

## MULTIPLE FIRMNESS MULTIPLE SLEEPER MATTRESS

**James E. Gilhooly, 31550 Agoura Rd., Apt. 5, Westlake Village, Calif. 91361**

**Filed Dec. 26, 1978, Ser. No. 972,927**
**Int. Cl.[2] A47C 27/15, 23/00**
**U.S. Cl. 5—464** **11 Claims**




1. An improved multiple firmness, multiple sleeper mattress, said mattress comprising integral resilient means defining three separate areas of different firmness extending along the width of said mattress, each of said separate areas being in a side-by-side relationship with each area extending the full length of said mattress, including:

(a) First means, defining a first area extending along the entire length of the left side of said mattress which has a substantially constant first firmness and which is adapted to support a first sleeper,

(b) Second means defining a second area extending along the entire length of the right side of said mattress which has a substantially constant second firmness which is different from said first firmness, and which as adapted to support a second sleeper,

(c) Said second means extending generally parallel to said first means, and

(d) Third means, defining an intermediate area extending along the entire length of the mid-portion of said mattress and disposed between and integrally connected to both said first and second means,

(e) Said intermediate area having a constantly varying firmness extending across its width, with the firmness of the third means adjacent to the first means approximating the firmness of said first means and the firmness of the third means adjacent to the second means approximating the firmness of the second means.

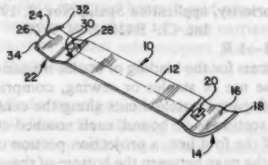
---

**4,213,215**

## CONTAINER OPENER

**A. Douglass Hall, David's Hill Rd., Bedford Hills, N.Y. 10507**

**Filed Mar. 28, 1978, Ser. No. 891,051**
**Int. Cl.[2] B67B 7/00**
**U.S. Cl. 7—152** **4 Claims**




1. In a container opener having at least a bottle opener at one end of a handle including a lip for engaging the top of a bottle cap and a tang for engaging under the skirt of the cap for prying the cap from a bottle, wherein the improvement comprises:

means for piercing the skirt of a threaded bottle cap projecting from the tang; and

a first pair of curved spaced apart teeth projecting from the free end of the lip each terminating in a point for engaging the top of the threaded bottle cap at two locations, wherein the curve of the first of said pair of teeth projecting from the lip is directed toward the tang and the curve of the second of said pair of teeth is directed away from the tang so that when the tang piercing means engages the skirt of the threaded bottle cap and each of the pair of teeth of the lip are in piercing engagement with the top of the threaded bottle cap counterclockwise rotation of the opener will rotatably facilitate removal of the threaded bottle cap.

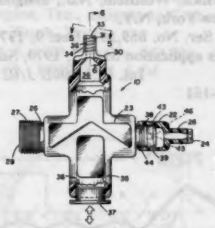
---

**4,213,216**

## SERVICE TOOL

**Richard V. Strybel, Elk Grove Village, Ill., assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed Oct. 13, 1978, Ser. No. 950,955**
**Int. Cl.[2] B25F 1/00**
**U.S. Cl. 7—170** **14 Claims**



1. A service tool structure for forcibly coaxially installing an annular gasket in a complementary hose coupling recess defining a threaded outer portion and an inner portion having an axially adjustable valve depressor coaxially therein, said tool structure comprising:

a handle;

a first projection on the handle defining means for releasably carrying the gasket coaxially thereon for coaxial insertion of the projection and gasket thereon into an outer portion of the coupling recess to retain initially an axially inner portion of the gasket in the recess coaxially about an axially outer portion of the valve depressor in a partially installed disposition thereof; and

a second projection on the handle defining a transverse end surface defining means for engaging the outer end of the gasket fully about the annular extent thereof and defining threaded means for cooperating with the threaded recess portion of the coupling for threadedly urging said end surface coaxially toward the valve depressor and thereby urge the gasket coaxially inwardly about the valve depressor to a fully installed disposition thereof.

**4,213,217**

## PROCESS FOR CONTINUOUSLY WASHING A PRINTED TEXTILE SHEET-LIKE STRUCTURE

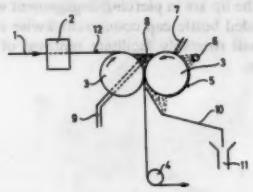
**Alfred Kretschmer; Wilhelm Ruettiger, both of Ludwigshafen, and Albrecht Wuerz, Maikammer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 20, 1978, Ser. No. 971,233**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757988**

**Int. Cl.[2] D06B *3/10***

**U.S. Cl. 8—151** **4 Claims**



1. A process for continuously washing a printed textile sheet-like structure, wherein water or an aqueous wash liquor is applied to the sheet-like structure in open width so that it takes up from 80 to 500% by weight of water based on the weight of the sheet-like structure, and the sheet-like structure is then squeezed off against a squeeze roller or rollers so as to remove at least 30% by weight of water based on the weight of the sheet-like structure, whereby removable material on the surface of the sheet-like structure is sheared off from the sheet-like structure and is transferred to the squeeze roller(s), from which it is then removed.

---

**4,213,218**

## IMPREGNATOR/RINSER

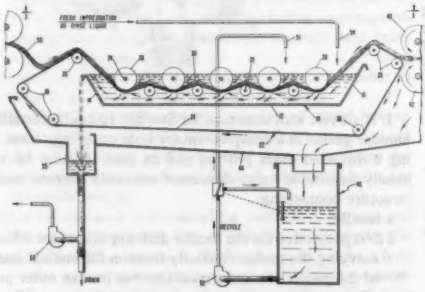
**Allen R. Winch, Westfield, N.J., assignor to Cotton Incorporated, New York, N.Y.**

**Division of Ser. No. 859,167, Dec. 9, 1977, Pat. No. 4,158,237**

**This application Mar. 7, 1979, Ser. No. 18,137**

**Int. Cl.[2] D06B *3/02***

**U.S. Cl. 8—151** **10 Claims**



1. A method of impregnating a moving fibrous batt with fluid by intermittently squeezing the batt, the method including the steps of:

conveying the moving batt in a generally longitudinal direction within a longitudinal tank of fluid on a single endless conveyor belt, the batt being arranged on an upper surface of the belt;

gently squeezing the batt while within the fluid in a nip defined between a first squeeze roller and the endless conveyor belt by passing the web and belt below the first squeeze roller provided within the tank;

carrying the batt on the conveyor belt above a singular roller to permit the batt to absorb fluid while within the fluid;

intermittently gently squeezing the batt by passing the batt alternately between at least one other squeeze roller and the belt and above both the batt and at least one other singular roller; and

conveying the batt from a squeeze roller out of the longitudinal tank.

---

**4,213,219**

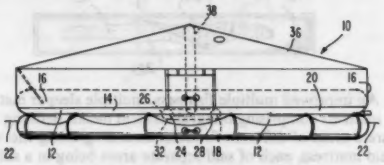
## TENSIONING DEVICE FOR AN INFLATABLE STRUCTURE

**Clarence Melander, Newark, Del., assignor to East Wind Industries, Inc., Dover, Del.**

**Filed Jun. 30, 1978, Ser. No. 920,866**

**Int. Cl.[2] B63C *9/02***

**U.S. Cl. 9—4 R** **10 Claims**



1. A tensioning device for an inflatable structure comprising:

(a) a deck means adapted to extend horizontally and provide a floor surface upon inflation of the inflatable structure;

(b) an outer inflatable member secured around the periphery of said deck means to support said deck means horizontally along the surface of the water upon inflation of said outer inflatable member; and

(c) an inner inflatable member integrally connected to said deck means to provide additional buoyancy to the central area of said deck means, said inner inflatable member integrally including a portion of the material of said deck means as a portion of the walls of said member to cause tightening and tensioning of said deck means upon inflation of said inner inflatable member, said inner inflatable member comprising:

(1) an upper wall section;

(2) a lower wall section formed by a portion of said deck area; and

(3) a continuous connecting means located around the periphery of said upper and lower wall sections to join each together for defining a hermetically sealed chamber to provide said inner inflatable member and to increase the central buoyancy and the tension applied to said deck means.

---

**4,213,220**

## PROCESS FOR THE BINDING OF BOOKS, MAGAZINES AND THE LIKE

**Luis J. A. Lopez-Martinez, 22B, c/Orense, Madrid 20, Spain**

**Filed Oct. 24, 1978, Ser. No. 954,239**

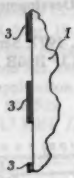
**Claims priority, application Spain, Nov. 4, 1977, 463.840**

**Int. Cl.[2] B42C *5/04, 9/00***

**U.S. Cl. 11—1 R** **6 Claims**

1. A process for the binding of books, magazines and the like without the use of staples or sewing, comprising forming a plurality of spaced notched cuts along the central fold line of each page section to be bound, each notched cut extending to one side of the fold line, a projection portion comprising that portion of the page between the bottom of the notched cut and said central fold line, folding each page section along said central fold line so that said projection portions project from the fold line on the opposite side of the fold line from the notched cut, nesting the page sections one within another with

the projection portions on an inner page passing through the notched cut in each of the pages outwardly thereof so that the



corresponding projection portions on adjacent pages overlap, and gluing together the overlapping projection portions of adjacent pages.

---

**4,213,221**

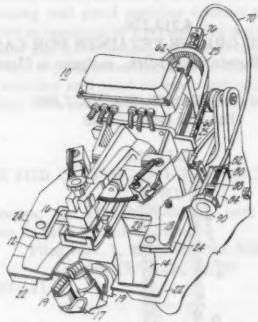
**WIPER MOTION STOP**

**Alphonse C. Kulik, Ipswich, Mass., assignor to USM Corporation, Farmington, Conn.**

**Filed Oct. 25, 1978, Ser. No. 954,484**

**Int. Cl.[2] A43D *21/00***

**U.S. Cl. 12—12.4** **5 Claims**



1. A shoe lasting machine for lasting a variety of sizes and styles of shoes therewith, said machine comprising:

a frame for supporting a wiper arrangement thereon; said wiper arrangement including:

a pair of wipers mounted on a wiper head;

a pair of wiper carriers for holding and guiding said wipers;

a wiper support plate arranged beneath said wiper carriers;

a cam plate arranged over said pair of wiper carriers to hold said wiper carriers against said support plate and help guide them therebetween in their opening and closing movements;

a piston and cylinder arrangement connected between said wipers and said frame for effecting the movement of said wipers with respect to said frame of said machine;

means for preselecting the rotational distance of travel of said wipers against the forepart of a shoe being lasted on said machine, permitting said machine to effectively and safely inwipe a variety of shoes.

**4,213,222**

**CLEANING APPARATUS FOR A WEB OF PLASTICS FILM HAVING A MAGNETIC COATING**

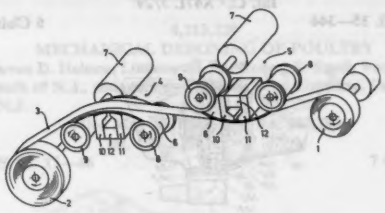
**Klaus Schoettle, Heidelberg; Peter Dobler, Ludwigshafen; Helmut Lewin, Bobenheim-Roxheim, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 28, 1978, Ser. No. 973,799**

**Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 7801442[U]**

**Int. Cl.[2] B08B *11/00***

**U.S. Cl. 15—100** **3 Claims**



1. An apparatus for continuously cleaning the surface of a web of plastics film provided with a magnetic coating, especially the surface of a magnetic tape, the surface to be cleaned being kept in close contact with a tape of nonwoven fabric by virtue of the configuration of the path of travel of the web, wherein the poles of a magnet, which define an air gap, are located in the region of the contact area, behind the tape of nonwoven fabric, on the side facing away from the web of coated plastics film.

---

**4,213,223**

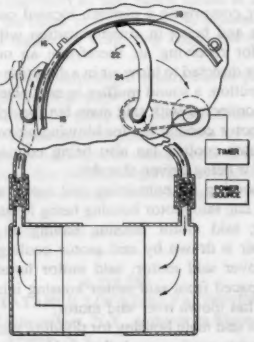
**TAPE CARTRIDGE STRAP CLEANER**

**Phillip A. Cosby, Arlington, Tex., assignor to Graham Magnetics Incorporated, Ft. Worth, Tex.**

**Filed Oct. 5, 1978, Ser. No. 948,704**

**Int. Cl.[2] B08B *5/02, 5/04***

**U.S. Cl. 15—304** **13 Claims**




1. Apparatus for cleaning the interior surface of a generally cylindrical ring-shaped article comprising an air passage between the interior and exterior walls thereof and without contaminating said passage, said apparatus containing

(a) means to mount said cylindrical object in a fixed position

(b) positive pressure supply means to continuously supply air into apertures in said exterior wall and through said passage to apertures in the interior wall

(c) suction cleaning means mounted for relative rotation

with, respect to and cleaning contact with, the interior wall of said cylindrical article

(d) said positive pressure means serving to continuously bar any debris, loosened by said cleaning means during said cleaning, from entering said apertures and said passage during cleaning.

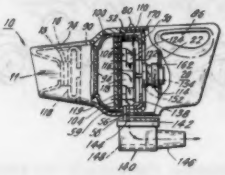
---

**4,213,224**

**BY-PASS TYPE PORTABLE VACUUM CLEANER**

**Jonathan Miller, Williamsport, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.**

**Filed Aug. 21, 1978, Ser. No. 935,265**
**Int. Cl.² A47L *5/24***
**U.S. Cl. 15—344** **6 Claims**



1. A vacuum cleaner, of the portable variety, or the like, comprising:

a main housing; an inlet into said main housing, said main housing inlet facing in one direction;

a filter in said housing for passing air therethrough and for trapping particulate materials thereon;

a main fan of the centrifugal type in said main housing and placed for drawing air through said main housing inlet and past said filter; said main fan having an inlet which is axial of said main housing and is placed to receive air that has been moved through said filter; said main fan having an outlet to which said main fan blows air; said outlet from said main fan is radial of said main housing;

an outlet from said main housing and communicating with said main fan outlet, whereby air is blown out of said main housing through said main housing outlet; said main housing outlet being placed radially outwardly of said fan outlet;

a chamber comprising a plenum, located outside said main housing and being in communication with said housing outlet for receiving air therefrom; an outlet from said chamber directed to blow air in a direction away from said one direction; a sound muffler in said plenum;

a motor connected with said main fan for driving said main fan; a motor cooling fan for blowing air over said motor; said motor cooling fan also being connected with said motor for being driven thereby;

a motor housing for containing said motor and said motor cooling fan; said motor housing being located in said main housing; said motor housing having an inlet through which air is drawn by said motor cooling fan for being blown over said motor; said motor housing having an outlet spaced from said motor housing inlet for outlet of air that has blown over said motor;

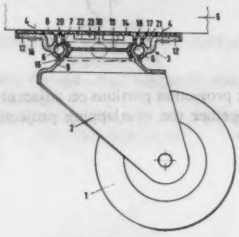
a divider in said main housing for dividing said main housing into separate portions such that air blown over said motor by said motor cooling fan from said motor housing inlet to said motor housing outlet does not mix in said main housing with air blown by said main fan, and such that air blown by said main fan from said main housing inlet to said main housing outlet does not blow over said motor; said motor housing outlet being at one side of said divider of said main housing, and said main fan, said main fan outlet and said main housing outlet being at the other side of said divider.

**4,213,225**

**CASTOR ASSEMBLY**

**Hendrikus J. M. Timmer, Tiel, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands**

**Filed Jul. 11, 1977, Ser. No. 814,349**
**Int. Cl.² B60B *33/00***
**U.S. Cl. 16—21** **5 Claims**



1. A castor assembly comprising an upper fixing plate of cup-like form including a planar flange forming a top plate, an outer bearing race projecting downwardly from said flange, a swivelling fork having an inner race for the bearing, a plurality of rolling elements in the annular space between the inner and outer races, a cover mounted to said flange overlying said races, said cover having tubular projections which fit into holes for bolts in the top plate of the rolling bearing, said projections being slightly longer than the material thickness of the top plate at the place of the holes for the bolts such that during mounting of the castor on a device, the projections can function as lock-nuts.

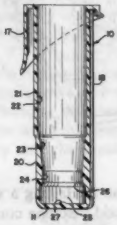
---

**4,213,226**

**BUSHING AND GREASE RETAINER FOR CASTERS**

**Carl J. Demrick, Birmingham, Mich., assignor to Herder, N.V., Curacao**

**Filed Jan. 29, 1979, Ser. No. 7,480**
**Int. Cl.² B60B *33/00***
**U.S. Cl. 16—36** **5 Claims**



1. A bushing and grease retainer for casters comprising a generally cup-shaped bushing having a closed bottom end, said bushing having a cylindrical outer wall, and an integral shroud extending radially outward at the top end of the bushing and downwardly around the bushing providing an enclosure adjacent said top end encircling a portion of the bushing, said cylindrical wall being of a major diameter for a major extent of the bushing, and a smaller diameter of said wall for a relatively lesser extent of the bushing adjacent said bottom end, an outer positioning bead extending vertically of the bushing as a projection from said cylindrical wall, an interior bearing surface provided throughout said major extent of the bushing, an interior pocket adjacent said bottom end, and an upwardly tapering surface extending between said pocket and said interior bearing surface.

**4,213,227**

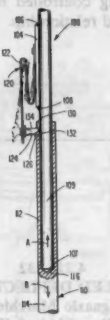
## TELESCOPING HEAT RESPONSIVE RELEASING MEANS

**Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901**

**Division of Ser. No. 779,044, Mar. 18, 1977, Pat. No. 4,099,292, which is a continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304. This application Mar. 13, 1978, Ser. No. 885,519**

**Int. Cl.[2] E05F *15/20***

**U.S. Cl. 16—48.5** **14 Claims**



1. A heat responsive releasing device, comprising:
(a) a mounting member;
(b) a pawl member slidably engaging said mounting member, said pawl member tracking relatively along said mounting member between at least restrained and activated positions defined along said mounting member; and
(c) bimetallic means mounted on said mounting member for restraining said pawl member relative to said mounting member in response to a preselected normal ambient temperature and for releasing said pawl member in response to at least a preselected increase in said ambient temperature whereby said pawl member and said mounting member may then slide relative to each other.

---

**4,213,228**

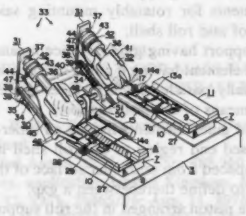
## DEVICE FOR CUTTING OFF THE NECK MEAT OF A FOWL

**Seigi Komatsu, and Hiroshi Kitajima, both of Kobe, Japan, assignors to Seigi Komatsu, Japan**

**Filed Nov. 1, 1978, Ser. No. 956,802**

**Int. Cl.[2] A22C *21/00***

**U.S. Cl. 17—11** **6 Claims**



1. A device for cutting meat from the neck of a fowl, said device comprising a machine frame, a suction blower mounted on said machine frame, vacuum chamber defining means connected with said suction blower so as to have its interior brought under vacuum by said suction blower, said vacuum chamber defining means having an elongated suction hole formed in the upper portion thereof communicating with its interior, an elongated cutting blade located adjacent said suction hole and having an elongated cutting edge extending generally parallel to the longitudinal axis of said suction hole, said cutting blade forming a gap between its cutting edge and said vacuum chamber defining means which gap is of substantially smaller width than the neck bone of a fowl neck to be processed whereby the meat from such neck may be drawn into said gap by the vacuum existing in said vacuum chamber means while said bone is precluded from entering said gap, a stationary support blade overlying said cutting blade and having an elongated edge spaced rearwardly a small distance from said cutting edge of said cutting blade, and means for reciprocating said cutting blade along the length of said suction hole.

---

**4,213,229**

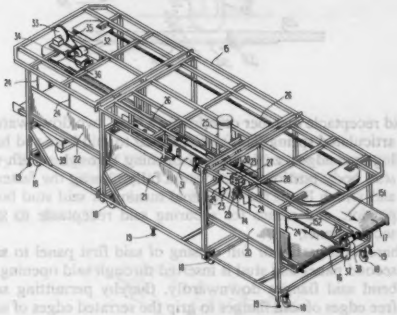
## MECHANICAL DEBONING OF POULTRY

**Warren D. Helmer, Lindenwold, and Robert E. Small, Voorhees, both of N.J., assignors to Campbell Soup Company, Camden, N.J.**

**Filed May 25, 1978, Ser. No. 909,380**

**Int. Cl.[2] A22C *21/00, 17/04***

**U.S. Cl. 17—46** **7 Claims**



1. Apparatus for dry centrifugal separation of poultry meat from bone comprising means for holding at least one poultry leg-thigh section at an end thereof, motor means for imparting rotational motion to said holding means, which rotational motion may be controlled by said motor means at an acceleration rate within the range of from one to 40 radians per second per second, and means for collecting fragments of separated meat.

2. A method of dry centrifugal separation of poultry meat from bone comprising the steps of:
(a) attaching a poultry piece to a holding means;
(b) gradually imparting rotational motion to said holding means at speeds sufficient to cause pieces of meat to separate from bone due to centrifugal forces alone, said speeds being insufficient to cause the holding means to fracture the bone; and
(c) collecting said pieces of meat.

---

**4,213,230**

## ROTATABLE LOCKING FASTENER

**Cuyler Hoen, Rennesselaer, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.**

**Filed Jun. 30, 1978, Ser. No. 920,842**

**Int. Cl.[2] A44B *17/00*; F16B *21/07***

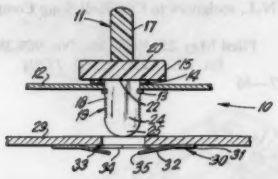
**U.S. Cl. 24—217 R** **6 Claims**

1. A locking type fastener comprising a turn member assembly attached to a first panel and a receptacle member attached to a second panel;
said turn member assembly including a cap attached to said first panel, a turn member rotatably mounted relative to said cap, a turn member spring positioning means to resiliently and rotationally orient said turn member with re-

spect to said first panel by returning said turn member to a preselected position after unlocking of said fastener;

said turn member assembly further including a first stop means to limit the rotation of said turn member to no more than one-quarter turn in the direction it unlocks said fastener and a second stop means to limit the return of said turn member by said spring positioning means upon unlocking said fastener so that said turn member returns to its preselected position to be relocked;

said turn member including a turning means to rotate said turn member and a stud having a body portion, said stud body portion being an elongated sheet metal body member with flat opposed sides, parallel opposed serrated edges and a blunt nose portion, said turn member further including panel attachment means to rotatably attach said stud to said first panel;



said receptacle member comprising a base, two downwardly articulated spring flanges connected to said base and having free edges, an elongated opening through which the stud body portion protrudes on fully closing the fastener and which limits the rotational turning of said stud body portion, and means for securing said receptacle to said second panel;

wherein on partial or full closing of said first panel to said second panel said stud is inserted through said opening to bend said flanges downwardly, thereby permitting said free edges of said flanges to grip the serrated edges of said stud body portion; and

wherein on turn member rotation said body portion will disengage from said flanges producing fastener unlock and permitting withdrawal of said turn member from said receptacle and consequent panel separation.

---

**4,213,231**

## MANUFACTURE OF METAL STRIP

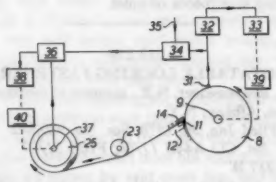
**Andrew Middlemiss, and Dalip T. Malkani, both of Sheffield, England, assignors to British Steel Corporation, London, England**

**Filed Jul. 14, 1978, Ser. No. 924,723**

**Claims priority, application United Kingdom, Jul. 13, 1977, 29804/77**

**Int. Cl.[2] B21C *37/04, 37/02***

**U.S. Cl. 29—18** **8 Claims**



1. A method of manufacturing metal strip from a cylindrical workpiece which comprises the steps of rotating the workpiece about its axis, feeding a cutting tool at a predetermined rate continuously into the peripheral surface of the rotating workpiece to produce a continuous metal strip peeled from the periphery of the workpiece, collecting the peeled strip by winding it around a rotating coiler, controlling the rotational speed of (a) the workpiece and (b) the coiler, to maintain their peripheral speed substantially constant, and controlling the angular velocity of (b) the coiler and (a) the workpiece, respectively, in accordance with a time-dependent derived relationship to maintain a predetermined ratio between the peripheral speeds of (a) the workpiece and (b) the coiler, the peripheral speed of the workpiece being kept constant when the angular velocity of the coiler is being controlled in accordance with said time-dependent derived relationship, the peripheral speed of the coiler being kept constant when the angular velocity of the workpiece is being controlled in accordance with said time-dependent derived relationship.

---

**4,213,232**

## CONTROLLED DEFLECTION ROLL

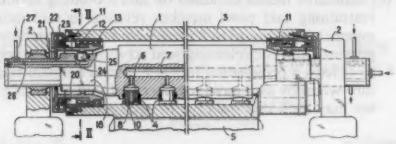
**Mario Biondetti, and Ignazio Marchioro, both of Shio, Italy, assignors to Escher Wyss Limited, Zürich, Switzerland**

**Filed May 23, 1979, Ser. No. 41,762**

**Claims priority, application Switzerland, Jun. 2, 1978, 6068/78**

**Int. Cl.[2] B21B *13/02***

**U.S. Cl. 29—116 AD** **2 Claims**



1. A controlled deflection roll comprising:

a stationary roll support;

a roll shell;

means for mounting said roll shell to be rotatable about said stationary roll support;

pressure elements arranged between said roll support and said roll shell;

said roll shell having opposed end regions;

guide elements for rotatably mounting said opposed end regions of said roll shell;

said roll support having guide surface means;

each guide element having a guide opening bounded by two substantially parallel guide surfaces guided at said guide surface means of said roll support;

each of said guide elements having an inner surface;

each opposed end region of the roll shell having an outer surface spaced from said inner surface of the related guide element to define therebetween a gap;

a respective piston arranged in the roll support at the region of each guide element and actuatable by a pressurized fluid medium for axial movement in said gap in the direction of said inner surface of the related guide element;

said piston having a pressure-exerting direction essentially in a pressure plane of the controlled deflection roll and effective in a direction opposite to the direction of pressure exertion by the pressure elements; and

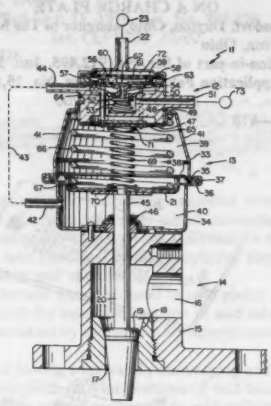
each said piston, when actuated, serving to contact said inner surface of the related guide element.

**4,213,233**

## METHOD OF MAKING A PILOT OPERATED VALVE POSITIONER

**Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 800,299, May 25, 1975, Pat. No. 4,143,850.**
**This application Dec. 11, 1978, Ser. No. 968,022**
**The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.**
**Int. Cl.² B23P *15/00*; F16K *31/12***
**U.S. Cl. 29—157.1 R** **5 Claims**



1. In a method of making a pilot operated valve positioner having pilot valve means operated by a pneumatic signal to pneumatically operate an actuator means carrying a main valve member to position the same relative to its main valve seat in a valve unit in relation to the magnitude of said pneumatic signal, said actuator means having a range spring and a feedback spring for said pilot valve means, said springs being coiled compression springs and being substantially concentrically mounted, the improvement comprising the step of disposing part of the housing means of the pilot valve means concentrically within one end of said range spring of said actuator means so that a positioning diaphragm means of said pilot valve means is also concentrically disposed in said one end of said range spring and engages one end of said feedback spring to render said valve positioner relatively small and compact.

---

**4,213,234**

## METHOD AND APPARATUS FOR MANUFACTURING VEHICLE WHEEL RIMS FROM SPIRALLY WOUND SHEET METAL

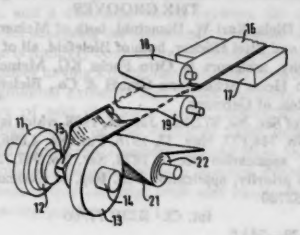
**Peter G. Ware, Rugby, England, assignor to Dunlop Limited, London, England**

**Filed Apr. 8, 1977, Ser. No. 785,960**
**Claims priority, application United Kingdom, Apr. 20, 1976, 15864/76; Jun. 12, 1976, 24465/76; Aug. 11, 1976, 33338/76**
**Int. Cl.² B21H *1/02*; B65H *81/00***
**U.S. Cl. 29—159.1** **25 Claims**

1. A method of manufacturing a wheel rim for a pneumatic tire, said rim having bead retention flanges upstanding from its axially outer sides, the method comprising:

winding a strip of thin ductile sheet metal spirally onto a former having a profiled peripheral configuration corresponding to the interior configuration of the rim with portions on its axial width of different diameters;

deforming the strip as it is wound into a configuration having said bead retention flanges by maintaining it under longitudinal tension while winding;



interposing an adhesive between superimposed turns of the strip.

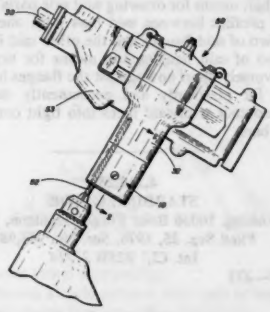
---

**4,213,235**

## SEAL REMOVER

**Gary Kemmerling, 7165 Fillmore Rd., Mentor, Ohio 44060**

**Filed Oct. 13, 1978, Ser. No. 951,023**
**Int. Cl.² B23P *19/02***
**U.S. Cl. 29—235** **4 Claims**



1. An apparatus for use in removing from within a mechanism, annular seals surrounding a shaft extending from said mechanism, the apparatus comprising:

(a) a body including a central bore therethrough having two portions;

(b) one of said bore portions for coacting with and engaging the end contour of the shaft, said one portion being threaded and adapted to threadedly engage the end of the extending shaft;

(c) the second portion of said bore having a diameter larger than the diameter of the first bore portion so that clearance is provided for the non-engaged portions of the extending shaft;

(d) the body further including a reduced diameter end section adapted to enter the bore of the mechanism from which the shaft extends to minimize relative lateral movement between the apparatus and the mechanisms;

(e) means for locking said body to said shaft; and,

(f) at least one drill guide hole disposed longitudinally between the outer wall and the central bore of said body.

4,213,236

## TOOL FOR DEFORMING A PLURALITY OF GROOVE DEFINING FLANGES AGAINST INSULATING BARS IN THE GROOVES

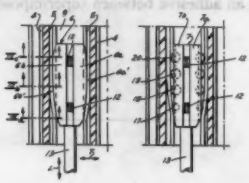
Manfred Diels; Karl W. Dienstuhl, both of Meinerzhagen; Tilo Jäger, and Eitel Höcker, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Otto Fuchs KG, Meinerzhagen and Schüco Heinz Schürmann GmbH & Co., Bielefeld, both of, Fed. Rep. of Germany

Division of Ser. No. 872,121, Jan. 24, 1978, which is a division of Ser. No. 744,177, Nov. 22, 1976, Pat. No. 4,096,678. This application Dec. 8, 1978, Ser. No. 967,738

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1975, 2552700

Int. Cl.² B23P 11/00

U.S. Cl. 29—243.5 4 Claims



1. A tool for making a construction element from a pair of elongated metallic profiles each formed with two parallel grooves each formed in turn by a respective pair of parallel flanges and each receiving one side of a respective bar of insulating material whose other side is received in the respective groove of the other profile, said tool comprising a pair of side parts defining a pair of opposite faces each engageable with one of said flanges of the two pairs of flanges receiving a respective bar; means for drawing said side parts longitudinally along said profiles between said bars with one of said faces engaging two of said flanges and the other said faces engaging another two of said flanges; and means for urging said side parts transversely apart and against the flanges in contact with said faces for plastically and permanently deforming said flanges in contact with said faces into tight contact with the respective bars.

---

4,213,237

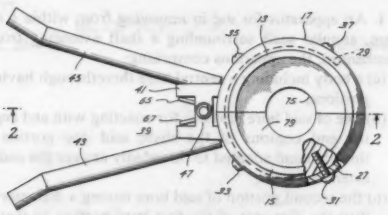
## STABBING GUIDE

Winslow Whiting, 10030 Briar Forest, Houston, Tex. 77018

Filed Sep. 25, 1978, Ser. No. 945,987

Int. Cl.² B25B 27/14

U.S. Cl. 29—272 5 Claims



1. A stabbing guide tool for facilitating makeup of threaded pin and box tubing connectors comprising

an infundibulum made of lubricous plastics material having a hardness greater than that of elastomer rubber (above 90 Shore A scale) and less than that of steel,

said infundibulum being split diametrally into two parts with hinge means at one end of the split, torsion spring means biasing the two parts together into closed position,

a pair of arcuate aluminum plates each extending about said infundibulum on opposite sides thereof from adjacent said hinge means over half way toward the other end of the split, screws means securing the plates to the infundibulum, and

a handle extending generally radially from each plate adjacent the hinge, the handles diverging to a hand grip spacing, whereby upon pressing the handles together with the hand the infundibulum is opened.

---

4,213,238

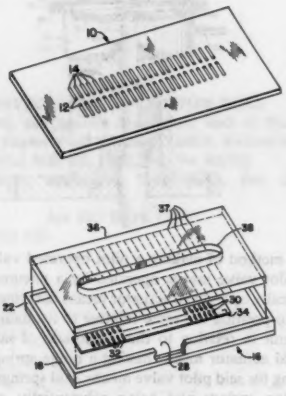
## METHOD OF FORMING A LEAD TO AN ELECTRODE ON A CHARGE PLATE

James L. Gudorf, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 912,495, Jun. 5, 1978. This application Feb. 26, 1979, Ser. No. 15,198

Int. Cl.² H05K 3/00

U.S. Cl. 29—878 9 Claims



1. A method of producing a charge plate for an ink jet printer comprising the steps of:

(a) fabricating a master plate including a series of regularly spaced orifices,

(b) coating a side of said master plate with photoresist material, exposing the photoresist material through a positive working mask containing open areas corresponding to the areas immediately adjacent said orifices and lines extending from each individual orifice, developing the photoresist material, and removing that portion of the material from the exposed areas,

(c) casting, in a mold fixture, an elastomeric molding material against said master plate and into said orifices, thereby producing an elastomeric mold comprising a base, a series of pins projecting outwardly from said base, and a series of ribs extending outwardly from each of said pins,

(d) separating said master from said elastomeric mold while maintaining said elastomeric mold in said mold fixture,

(e) producing a series of electrodes and leads by coating said pins and ribs with a transferrable coating of electrically conductive material,

(f) fabricating a rigid and durable support plate structure having a medially extending elongated slot,

(g) placing said support plate against said elastomeric mold with said slot surrounding said pins,

(h) casting into said slot and against said elastomeric mold and said coated pins and ribs an electrically nonconductive polymeric casting material of a type which is curably adherent to aid support plate and said electrodes and leads,

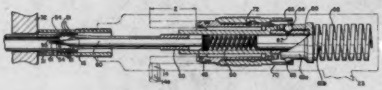
(i) curing said polymeric casting material to define a charge plate structure having a series of regularly spaced charge electrodes and leads,
(j) separating said charge plate structure from said elastomeric mold, and
(k) removing excess material from the surfaces of said charge plate structure.

---

**4,213,239**
**TUBE EXTRACTOR**

Burt Filer, c/o Heat Exchanger Tool Corporation, P. O. Box 2, Trevose, Pa. 19047

Filed Oct. 11, 1978, Ser. No. 950,276
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—726 10 Claims



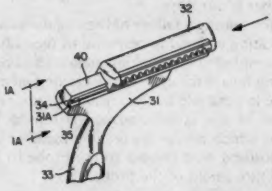
1. A tube extractor for extracting expanded tube ends from the tube sheet of a heat exchanger which comprises
an outer housing having a forward extension for engagement with the tube sheet and having a cylinder therein,
a piston within said cylinder,
expansible broach means secured to said piston and having cutting teeth for insertion into one of said tube ends,
a mandrel actuated by said piston for intermittent movement thereof,
said mandrel having a forwardly converging end portion for engagement with interior portions of said broach means,
a fluid pressure supply connected to said cylinder for moving said piston to expand said broach means into cutting engagement with a tube end, and
clutch means actuated by longitudinal movement of said piston for first rigidly locking and then upon further movement releasing said mandrel to move with said broach member for tube extraction.

---

**4,213,240**
**LADIES' RAZOR SYSTEM**

Frank A. Ferraro, Trumbull, and Ernest F. Kiraly, Fairfield, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 787,657, Apr. 14, 1977, abandoned.
This application Oct. 20, 1978, Ser. No. 953,306
Int. Cl.[2] B24B *21/22, 21/14, 21/52*
U.S. Cl. 30—47 9 Claims



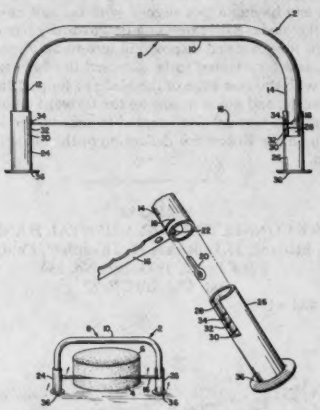

1. A replaceable blade cartridge shaving system comprising:
an elongated handle member having a head portion extending transversely thereof, the head portion including a pair of longitudinally extending co-planar opposed flange members extending substantially perpendicular to the head portion and a substantially rigid protuberance member located medially of the flanges and extending a predetermined significant distance beyond the plane containing the flanges; and
a replaceable blade cartridge having coupling structure defining two opposed spaced grooves adapted for longitudinal slidable engagement with the flange members for attaching the cartridge to the handle in a desired shaving position, and a clearance recess between the coupling grooves for accepting the protuberance member when the cartridge is slidingly coupled to the handle, said protuberance member having a particular geometry transversely of the longitudinal extent of said flange members, and the geometry of said clearance recess transversely of the longitudinal extent of said cartridge being sufficient to clear said protuberance member at least from one end of said cartridge continuously to a position enabling said attachment of said cartridge with said handle in said desired shaving position.

---

**4,213,241**
**CAKE LAYER CUTTER**

Ray E. Haapala, Rte. 3, Box 76, Dassel, Minn. 55325

Filed Mar. 30, 1979, Ser. No. 25,344
Int. Cl.[3] A21C *5/00*
U.S. Cl. 30—115 1 Claim

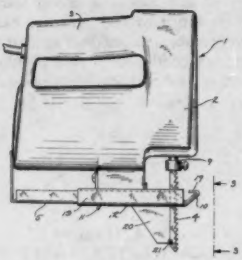


1. A cake-layer cutter comprising:
a U-frame having a bight portion and a pair of spaced parallel hollow tubular legs extending therefrom,
an elongate flat blade having opposite end portions respectively disposed in slots in the legs which extend in the circumferential directions of the legs, and
leg extension means extending from free ends of said legs and having free end portions adapted to slide along a table top upon which a cake-layer is supported,
said leg extension means comprising tubular members telescopically engaged on the frame legs and being slidable lengthwise along the frame legs,
each said leg extension means having a lengthwise slot therein for providing clearance over a blade end portion when the leg extension means is slid along the length of a frame leg and a plurality of other slot means extending in the circumferential direction of the leg extension means from the edge of the lengthwise slot therein and being spaced from one another in the lengthwise direction of the leg extension means, said other slots being selectively engagable over a blade end portion whereby to provide incremental adjustability of the distance between the blade and the free end portion thereof.

## 4,213,242
## ATTACHMENT FOR SABER SAW

Everett J. Partington, 620 S. Elizabeth, Oconomowoc, Wis. 53066

Filed Jan. 22, 1979, Ser. No. 5,555
Int. Cl.² B27B 11/02, 19/09
U.S. Cl. 30—374 11 Claims

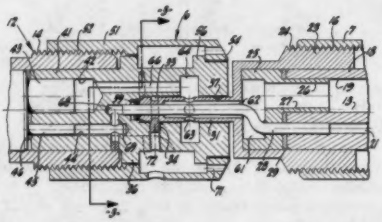


1. an attachment to be used with a saber saw, said saber saw having a casing and a generally flat base secured to the casing and having a reciprocating blade extending through a slot in said base, said attachment comprising a plate to be attached to the base and having a slot aligned with the slot in the base to receive the blade, a fin extending downwardly from the outer surface of the plate and disposed in fore-to-aft alignment with the slot, said fin adapted to be disposed in edgewise abutting relation with the rear edge of the blade to support the blade as a cut is made, and guide means on the forward edge of the fin and defining a vertical slot adapted to receive the lower portion of the blade to prevent deflection of the blade in a lateral direction.

## 4,213,243
## ROTARY CONNECTOR FOR A DENTAL HANDPIECE

Lloyd P. Flatland, 15 Quisisana Dr., Kentfield, Calif. 94904

Filed Jan. 2, 1979, Ser. No. 534
Int. Cl.² A61C 1/12
U.S. Cl. 433—126 8 Claims

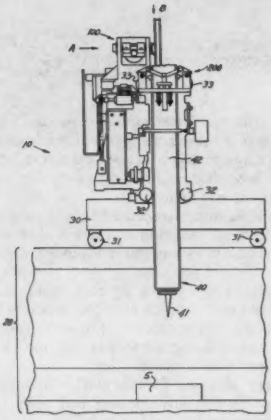


1. A rotary connector for a dental handpiece having an external handpiece thread and for a dental hose having a mating internal hose thread comprising a plug generally symmetrical about an axis and having a plug external thread adapted to engage said internal hose thread, a spindle extending from said plug along said axis, a socket generally symmetrical about said axis and journalled on said spindle for rotation about said axis, means interengaging said socket and said spindle for releasably precluding axial displacement thereof, a shoulder on said socket, a collar having a flange adapted to abut said shoulder and having internal threads adapted to engage said external handpiece thread, means defining in said plug an air inlet passage open to said hose and extending partway through said spindle and open through an orifice in the side of said spindle, means defining in said socket an air outlet passage open to said orifice and open to said handpiece, means including a tube defining in said plug a water inlet passage open to said hose and extending through said air inlet passage and projecting axially from said spindle, and means defining in said socket a water outlet passage open to said tube and open to said handpiece.

## 4,213,244
## COORDINATE MEASURING MACHINE HAVING A FAILSAFE PROTECTION SYSTEM

Frederick K. Bell, Centerville, and John J. Tuss, Englewood, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 8, 1978, Ser. No. 904,172
Int. Cl.² G01B 5/20
U.S. Cl. 33—1 M 6 Claims



1. In combination with an apparatus for measuring coordinates on a part, said apparatus being of the type having a base; a carriage mounted to the base for horizontal movement with respect to said base; a probe for engaging the part for measuring its coordinates, said probe including a portion extending vertically and mounted to said carriage to allow vertical movement of the probe with respect to said carriage, and means for counterbalancing said vertically mounted probe, the improvement wherein said apparatus additionally includes:

a braking member movably mounted to the carriage and positioned adjacent to the probe, said braking member including an inclined braking surface adapted to engage the probe in an interfering position when the braking member is moved;

means for sensing a failure of the counterbalance system and generating a signal in response to the failure; and

means coupled to said braking member and responsive to the sensing means for moving the braking member toward the probe in response to the sensing means, whereby when a failure of the counterbalance is sensed by the sensing means which moves the braking member into an interfering position with respect to the probe to stop the downward movement of the probe.

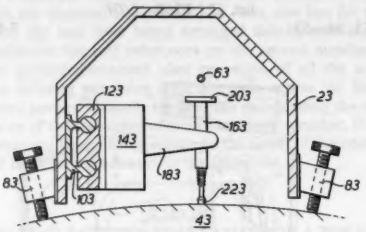
## 4,213,245
## PROFILE GAUGING

David A. Armstrong, Swansea, Wales, assignor to British Steel Corporation, London, England

Filed Feb. 3, 1978, Ser. No. 875,107
Claims priority, application United Kingdom, Feb. 8, 1977, 5180/77; Jul. 14, 1977, 29624/77; Nov. 2, 1977, 45580/77
Int. Cl.² G01B 7/28, 7/34
U.S. Cl. 33—174 P 22 Claims

1. Apparatus for gauging the surface profile of a workpiece

comprising a reference element extending at least the length of the workpiece surface to be gauged and having a reference surface against which the surface under test can be compared, means for maintaining said element under tension in the direction of its length, together with a sensor assembly supported by a carriage means enabling the sensor assembly to move along said element, said sensor assembly incorporating a pair of relatively moveable probes, one of the probes being supported in a manner whereby it follows the surface profile of the workpiece surface under test when moved along same, and the other probe being supported in spaced relationship adjacent said




reference surface and including a sensing means for sensing the electrical reactance between the sensing means and the reference surface, said other probe and sensing means moveable along said reference surface in spaced relationship with respect thereto, and means for moving said sensing means relative to said carriage means towards or away from said reference surface in response to the electrical reactance between the sensing means and the reference surface, whereby the sensing means and the reference surface can be maintained apart a predetermined distance while the sensor assembly is moved therealong.

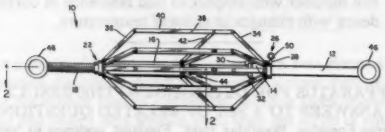
---

**4,213,246**

## COLLAPSIBLE AND ADJUSTABLE GAGE APPARATUS

**Daniel M. Stevens, 545 Pine Forest Dr., Athens, Ga. 30606**

**Filed Jul. 20, 1978, Ser. No. 926,522**
**Int. Cl.² G01B *3/02*; E21B *17/10***
**U.S. Cl. 33—178 F** **6 Claims**



1. A collapsible and adjustable gage apparatus for inspecting the inside of pipe, said apparatus having an expanded and a collapsed configuration and comprising:

a shaft;

first collar mounted on said shaft;

second collar mounted on said shaft;

a plurality of wear link members for engaging the innerwalls of pipe;

at least two articulated mechanical arms having one end of said arms pivotally attached to each of said wear link members, with the other end of one of said arms pivotally attached to said first collar and the other end of the other of said arms being pivotally attached to said second collar;

means for adjusting said first collar relative to said shaft, whereby said apparatus in said expanded configuration rigidly adjusts the position of said wear link members to engage the inner walls of different diameter pipe; and

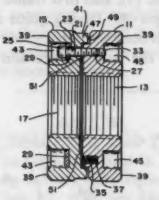
means for releasing said second collar, whereby said apparatus is collapsed to a reduced size.

**4,213,247**

## THREAD COMPLIANCE GAUGE

**Ernest H. Romine, 2301 Walnut Blvd., Walnut Creek, Calif. 94596**

**Filed Feb. 7, 1979, Ser. No. 9,796**
**Int. Cl.² G01B *3/36***
**U.S. Cl. 33—199 R** **5 Claims**



1. A thread compliance gauge for determining the accuracy with which screw threads have been formed on a shaft comprising

first and second ring members formed with internally threaded apertures which are threadably engagable with said shaft,

means for interlocking said ring members together and permitting relative rotation thereof with respect to each other for a portion of a revolution whereby as said members are rotated apart when interlocked and engaged on said threaded shaft the members tighten on the flank surfaces of the threads of the shaft and thereby center on the axis of generation of the threads of the shaft, said means for interlocking said ring members including at least one projecting stud formed on one of said ring members and disposed parallel to the axis of generation of the internal threads of said ring member, said stud extending through a corresponding arc shaped slot formed in the other of said ring members and having a flange which is disposed on the opposite side of the slotted ring member from the studded ring member so that as said ring members are moved apart by rotation during the centering process said flange prevents said ring members from separating beyond a limit permitted by the flange on the stud whereby said ring members are interconnected and permit limited relative rotation with respect to each other, said stud and flange being formed to create an equidistant gap between the ring members when said members are separated to the limit permitted by the flange on the stud; and

a cylindrical surface formed on one of said members concentric to the axis of generation of the internal threads thereof whereby when said members are interlocked and engaged with said shaft and centered with respect to the axis of generation of the threads thereof the shaft may be rotated and the concentricity of the screw threads formed thereon may be checked with respect to the axis of rotation of the shaft by measuring the concentricity of the rotating cylindrical surface with respect to the axis of rotation of the shaft.

---

**4,213,248**

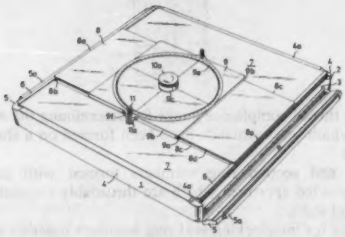
## NAVIGATIONAL AID DEVICE FOR DETERMINING DIRECTION IN A CHART

**Lars-Olow Jerhammar, Kanalgatan 112, 603 65 Norrköping, Sweden**

**Filed Feb. 9, 1979, Ser. No. 10,679**
**Claims priority, application Sweden, Feb. 9, 1978, 7801534**
**Int. Cl.² B43L *5/00, 13/04***
**U.S. Cl. 33—431** **6 Claims**

1. A device to define the direction relative to a reference direction from one point to a second one on a chart, comprising a base having a base surface for the chart, a member having a direction indicating index and being rotatable and displaceable relative to the base surface, said member being carried by

two mutually co-operating support means of which a first one is displaceable relative to the base surface in one direction along a stationary rectilinear guide means located on said base adjacent said base surface, and the second one is displaceable in a direction perpendicular thereto along a rectilinear guide means carried by said first support means, characterized by said first displaceable support means constituting a first rectangular transparent frame (8), said first frame at each one of two mutually opposite edges (8*a*) having guide means respectively co-operative with each one rectilinear guide means (6) which is stationary relative to the base surface and along which said



first frame is displaceable in said first direction, said first support means on each one of its two mutually opposite edges (8*c*) extending perpendicularly to said stationary guide means comprising guide means (8*d*) for slidably carrying said second support means, said second support means as well forming a transparent frame (9) and having at two opposite and mutually parallel edges guide means (*ab*) co-operating with the last mentioned guide means (8*d*) of said first frame, the direction indicating member (10) being journalled in said second frame with its axis of rotation substantially half-way between said guide means of said second frame.

---

**4,213,249**

**METHOD FOR PRECONDITIONING LUMPS OF SUGAR**

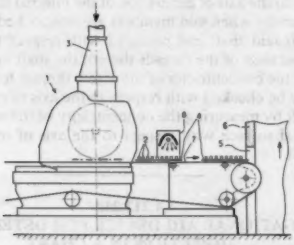
**Louis G. Corse, Chaumont-sur-Tharonne, France, assignor to Machines Chambon, Orleans-Cedex, France**

**Filed Nov. 29, 1978, Ser. No. 964,492**

**Claims priority, application France, Dec. 8, 1977, 77 37075**

**Int. Cl.[2] F26B *3/30***

**U.S. Cl. 34—12** **6 Claims**



1. A method for the preconditioning of moulded sugar lumps obtained from humidified and agglomerated caster sugar before the lumps are dried in a drying oven to avoid any thermal shock being applied to the lumps utilizing infra-red radiation upon entry thereof into the oven after moulding, comprising:

heating the sugar lumps after moulding and prior to their insertion into a drying oven for a very short period of time, but a sufficient period of time to form a cloud of steam-saturated atmosphere around each lump;

the steam-saturated atmospheric cloud forming a barrier against the infra-red radiation and avoiding the rapid drying of the lump; and,

carrying out said heating so that the temperature attained upon entering the oven after moulding is higher than the dew point.

---

**4,213,250**

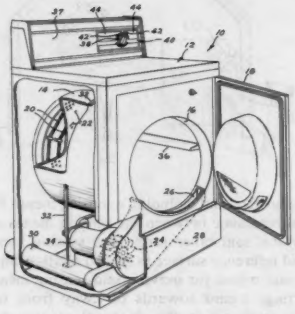
**TEMPERATURE COMPENSATION FOR CLOTHES DRYER TIMER SELECTORS**

**Larry L. Hawkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**

**Filed Oct. 23, 1978, Ser. No. 954,038**

**Int. Cl.[2] F26B *11/04***

**U.S. Cl. 34—53** **3 Claims**



1. A clothes dryer having at least one timer-controlled operational cycle for the drying of clothing articles placed therein, the control arrangement comprising:

timer means including a manually-settable control member and a reference, and means responsive to the setting of said control member with respect to said reference arranged to control the dryer run time of the operational cycle;

temperature compensation means including an element responsive to ambient room temperature and also including:

means cooperative between the temperature responsive element and said timer means to vary the dryer run time for said operational cycle for a given setting of said control member with respect to said reference in correspondence with changes in ambient temperature.

---

**4,213,251**

**APPARATUS FOR DETERMINING THE RESULT OF ANSWERS TO A SET OF RELATED QUESTIONS**

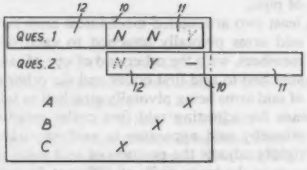
**Stavros Foundos, Wembley Park, England, assignor to National Research Development Corporation, London, England**

**Filed Sep. 7, 1978, Ser. No. 940,312**

**Claims priority, application United Kingdom, Sep. 19, 1977, 38926/77**

**Int. Cl.[2] G09B *3/06***

**U.S. Cl. 35—9 R** **11 Claims**




1. Apparatus for determining the result of answers to a

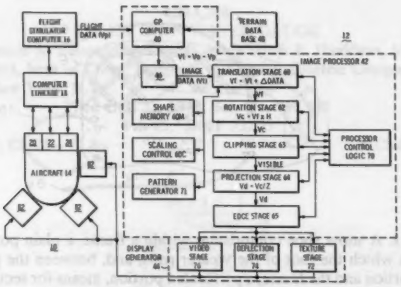
plurality of questions each having at least two answers, comprising a record member, a plurality of references recorded on the record member, each said reference representing the result of a combination of answers which includes an answer to each question, the apparatus further comprising a plurality of answer devices, one for every question, for presenting answer symbols, each said answer device being operable in accordance with an answer selected by the operator to present answer symbols representing the selected answer to the associated question, the presented answer symbols representing the selected answer to any one question being disposed in a line, whereby after operation of answer devices in accordance with answers selected for every question, the presented answer symbols are disposed in a plurality of lines, one line for every question, the said lines being arranged side-by-side immediately adjacent the said references on the record member, the answer symbols presented after operation of all the answer devices defining not more than one path across the lines of presented answer symbols, the said one path leading the operator to one of the said references on the record member, the said one reference being the reference to the result of the combination of the selected answers to the questions.

---

## 4,213,252
## REPEATING PATTERN SIMULATION OF A POLYGON FACE OBJECT SYSTEM

**John B. Sullivan, Santa Clara, and David R. Marsh, Los Altos, both of Calif., assignors to The Singer Company, Binghamton, N.Y.**

**Filed May 8, 1978, Ser. No. 903,414**
**Int. Cl.[2] G09B *9/08;* H04N *7/18***
**U.S. Cl. 35—10.24** **16 Claims**




1. An image data system for providing a two dimensional perspective display of object items within a three dimensional object coordinate system formed by polygon faces, including at least one object item formed by at least one series of equally spaced polygon pattern units of identical size and shape, each series of pattern units having an initial pattern unit which has an initial point, comprising:

data source means for providing image data in accordance with a predetermined data format including the following types of image data

initial position data for defining the position of the initial point with respect to the object coordinate system for the initial pattern unit of each of the series of pattern units,

shape data for defining the relative positions of the vertices of each initial pattern unit with respect to the initial point for that pattern unit,

increment data for defining the uniform spacing between adjacent pattern units within each series of identical pattern units,

series data for defining the number of identical pattern units within each series of identical pattern units,

other data associated with each initial point for defining other visual parameters for each series of identical pattern units therefor, the image data having codes bits associated therewith for distinguishing between the initial position data and the shape data and the other data;

image data decoder means responsive to the code bits for processing each type of image data;

storage means for receiving shape data and increment data in response to the image data control means and for repeatedly providing the data in response to the initial position data;

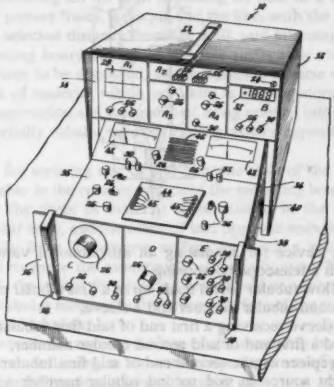
series means for receiving series data and terminating the retrieval of the shape data and increment data from the storage means when the proper number of identical pattern units have been processed.

---

## 4,213,253
## ELECTRONIC TEACHING AND TESTING DEVICE

**Drasutis Gudelis, Cos Cob, and David D. Vetrane, Shelton, both of Conn., assignors to Nida Corporation**

**Filed Jun. 12, 1978, Ser. No. 914,564**
**Int. Cl.[2] G09B *23/18***
**U.S. Cl. 35—19 A** **4 Claims**



1. A portable, self-contained, dual function electronic instrumentation device for teaching the principles of electricity and electronics and as a laboratory test instrument for testing electrical systems, comprising:

a housing; control, display and terminal elements extending externally of said housing; electrical circuit means arranged within said housing and electrically coupled to said control, display and terminal elements for transmitting electrical signals thereto; said housing having an exterior surface with at least some of said control, display and terminal elements extending outwardly therefrom, said exterior surface having a movable portion and a fixed portion; said movable portion being mechanically coupled to a normally concealed display surface having second display and control elements so that said display surface is exposed when said movable portion is moved relative to said fixed portion; said display surface having a receptacle with circuit card receiving means thereon for direct electrical coupling to a circuit card without the use of conductive wires when said display surface is exposed; said control, display and terminal elements of said housing with said second display elements, said second control elements and said receptacle of said display surface being interconnected with said electrical circuit means so that when said display surface and receptacle is concealed, electrical devices may be tested by electrically coupling an electrical device to said terminal elements by means of external conductive leads, and when said display surface and receptacle is exposed, a circuit card may be electrically coupled to said receptacle for teaching the principles of

electricity and electronics by way of the various display and control elements without use of external conductive leads.

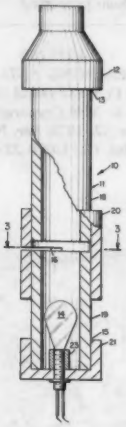
---

**4,213,254**

## ASTRONOMICAL OPTICAL SIMULATOR

**Thomas A. Whiting, 5715 Old French Rd., Erie, Pa. 16509**

**Filed May 15, 1978, Ser. No. 905,931**
**Int. Cl.[2] G09B *9/00*; G03B *21/00***
**U.S. Cl. 35—43** **8 Claims**



1. A device for simulating an astronomical view as seen through a telescope comprising,

a hollow tubular barrel made up of a first tubular member, a second tubular member and a sleeve,

said sleeve receiving a first end of said first tubular member and a first end of said second tubular member,

an eyepiece on the second end of said first tubular member,

a light source in said second tubular member adapted to project light towards said eyepiece,

an outwardly extending slot in said sleeve between said eyepiece and said light source,

a disk made of a thin, black, opaque material in said slot having holes formed therein to simulate the astronomical view as viewed through a telescope.

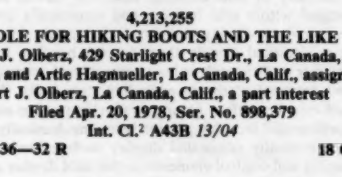
---

**4,213,255**

## SOLE FOR HIKING BOOTS AND THE LIKE

**Norbert J. Olberz, 429 Starlight Crest Dr., La Canada, Calif. 91011, and Artie Hagmueller, La Canada, Calif., assignors to Norbert J. Olberz, La Canada, Calif., a part interest**

**Filed Apr. 20, 1978, Ser. No. 898,379**
**Int. Cl.[2] A43B *13/04***
**U.S. Cl. 36—32 R** **18 Claims**



1. A sole member adapted to be affixed to an upper portion of a hiking boot and the like, the sole member having a heel portion at a rear end thereof, a toe portion at a front end thereof, a top surface and a bottom tread surface, the tread surface between first and second locations intermediate the ends of the sole member being disposed in a base plane of the sole member, the rear end of the sole member having a distinct substantially straight extent substantially perpendicular to the length of the sole member whereby the sole member has a substantially square heel when viewed from the top, the tread surface being curved concave upward proceeding rearwardly therealong from the first location so that the heel portion when viewed from the side along a line substantially parallel to the top surface has a first curved configuration in which the tread surface extends substantially cylindrically curvilinearly away from the base plane substantially to the top surface to the substantially straight extent of the sole member at the rear end thereof, the tread surface being curved concave upward proceeding forwardly therealong from the second location so that the toe portion when viewed from the side along said line has a second curved configuration in which the tread surface extends curvilinearly away from the base plane substantially to the top surface, whereby in use of a hiking boot and the like incorporating the sole member the configuration of the sole member tread surface adjacent the rear end of the member affords substantially line contact between the sole and a ground surface and tends to direct the boot and the like to roll straight ahead.

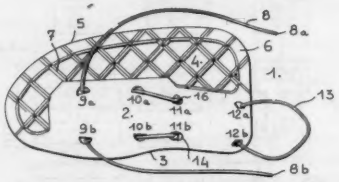
---

**4,213,256**

## SNOW SHOE

**Henri Mas, 14 Quai Antoine Ier, and Paul Lacroix, 8 bd du Jardin Exotique, both of, Monaco**

**Filed Jul. 18, 1978, Ser. No. 925,686**
**Claims priority, application France, Jul. 18, 1977, 77 22995; Jun. 20, 1978, 78 19400**
**Int. Cl.[2] A43B *5/04***
**U.S. Cl. 36—124** **11 Claims**



1. A snow shoe comprising, within a frame, a plain portion on which the foot of the wearer rests, and, between the plain portion and the frame, a perforated portion, means for securing the wearer's shoe to the snow shoe, and means on the underside of the snow shoe to grip the snow, the snow being elongated and the axis of said plain portion forming a small acute angle with the axis of the snow shoe.

---

**4,213,257**

## SECURING MEMBER FOR WEAR PARTS FOR EARTH-MOVING MACHINES

**Arne Johansson, and Torsten Larsson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden**

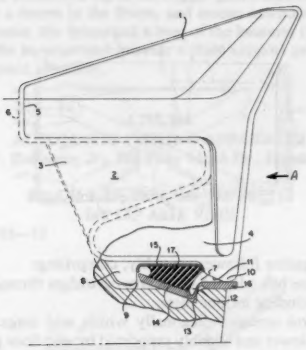
**Filed Sep. 5, 1978, Ser. No. 939,732**
**Claims priority, application Sweden, Sep. 6, 1977, 7709969**
**Int. Cl.[2] F16B *19/02***
**U.S. Cl. 37—142 R** **40 Claims**

1. Locking apparatus for securing teeth to excavators, loaders, scarifiers, dredge cutters and the like of the type in which each tooth is removably installed in a holder which secures the tooth against movement in all directions except the one from which the tooth is installed and removed, the holder and the tooth defining an open-mouthed recess therebetween within which the locking apparatus can be at least partially placed, the recess having an inner stopping edge located in either the tooth or the holder for limiting movement of the locking apparatus in the direction of installation of the tooth and an outer blocking

edge located in either the holder or the tooth for limiting movement of the locking apparatus in the direction of removal of the tooth, said locking apparatus comprising:

a first elongated edge member;

a second elongated edge member;



an elastic body located between and fastened to said first and second edge members; and

means provided on at least one of said edge members for permitting said edge member to buckle into contact with the outer blocking edge when said edge member is subjected to compressive stress.

---

**4,213,258**

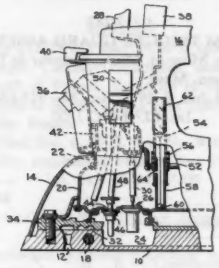
## STEAM IRON WATER GAUGE

**Kenneth A. Reinstadler, Derby, and William E. Davidson, Milford, both of Conn., assignors to General Electric Company, New York, N.Y.**

**Filed Oct. 23, 1978, Ser. No. 955,105**

**Int. Cl.[2] D06F *75/06***

**U.S. Cl. 38—77.2** **6 Claims**



1. In a steam iron with a connected handle and having steam control means, a fill opening to an interior water tank, a ported soleplate, a steam generating boiler with coverplate forming steam distribution passages and a water sight gauge connected to said tank, an improvement in said gauge comprising,

an opening forward in the top of said tank, closed top tube means sealed in and extending through said opening into said tank, aperture means through said tube within the tank upper portion,

a window extending and aligned along part of said tube and including the top thereof, and float means in said tube to indicate water level in said tank through said window,

whereby said gauge indicates water level and empty horizontally and indicates full water level in heel rest position to limit overfilling.

---

**4,213,259**

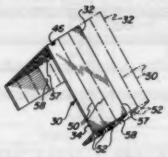
## WALL-MOUNTED DISPLAYS

**Alfred Coda, 48 Wyandemere Dr., Woodcliff Lake, N.J. 07675**

**Filed Nov. 17, 1978, Ser. No. 961,545**

**Int. Cl.[2] G09F *1/12, 7/20***

**U.S. Cl. 40—152.1** **16 Claims**



1. A mounting kit for wall mounting an item in a display, such as a picture frame, a plaque and the like, with the display spaced a selected distance from the wall, said kit comprising:

a mounting board having an obverse surface for receiving the item to be displayed, and an opposite reverse surface;

a sheet of material which normally is flat for storage and transportation and is capable of being erected into at least a partially tubular member having axially opposite ends; and

means for securing one of said opposite ends of the tubular member to the reverse surface of the mounting board such that the sheet of material is maintained in the erected tubular state, and the other of said opposite ends is spaced axially from the reverse surface for bearing against the wall to space the mounting board axially away from the wall, the means for securing one of said opposite ends of the tubular member to the reverse surface of the mounting board including

a groove in the reverse surface of the mounting board, the groove following a diamond-shaped plan configuration and including legs of equal lengths; and

an edge located along said one end of tubular member, the groove being complementary to the edge such that the edge is receivable within the groove, and the tubular member having at least a partial diamond-shaped cross-sectional configuration which, when inserted into the groove, extends fully along two contiguous legs thereof and at least partially along two further legs thereof.

---

**4,213,260**

## OVERLAY DEVICE FOR USE WITH AN ILLUMINATED TRANSPARENCY VIEWER

**Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.**

**Filed Jan. 12, 1978, Ser. No. 868,982**

**Int. Cl.[2] G09F *1/10***

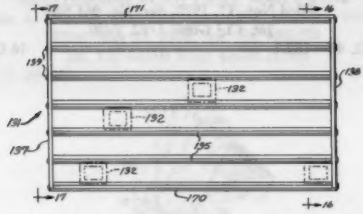
**U.S. Cl. 40—158 B** **7 Claims**

1. A device for releasably holding a plurality of flat, relatively stiff photographic slides of similar size each in a planar condition when in viewing position comprising:

a series of generally parallel elongate members each being spaced from an adjacent elongate member to permit the passage of light therebetween, adjacent elongate members having an opposed pair of generally parallel, longitudinally extending surfaces for supporting each photographic slide therebetween in viewing position, the opposed surfaces being spaced a greater distance than the height of each photographic slide to be supported therebetween;

frame members transverse to said elongate members and connected thereto for maintaining said elongate members in fixed relation; and

resilient cushioning material carried by at least one surface of each of said pairs of opposed surfaces and being spaced from the other surface of each of said pairs of opposed surfaces a distance less than the height of each photographic slide to be supported in said viewing position,



each slide being releasably held in its planar condition between opposed surfaces of adjacent elongate members by depressing the cushioning material and aligning the slide in viewing position between the opposed surfaces.

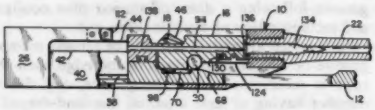
---

**4,213,261**

**BREECH LOCKING MECHANISM**

**James P. Claypool, 2124 Como Ave., St. Paul, Minn. 55108, assignor to James P. Claypool and James E. Trombley, both of St. Paul, Minn.**

**Filed Jun. 27, 1978, Ser. No. 919,501**
**Int. Cl.[2] F41C *11/06***
**U.S. Cl. 42—16** **7 Claims**



1. A breech lock mechanism for a firearm comprising:

(a) a receiver member having a first longitudinally extending guide track formed in a bottom surface thereof, first and second longitudinally extending guide slots formed in parallel and spaced apart side surfaces thereof and a barrel receiving bore formed in an end surface thereof and generally aligned with said first and second guide slots, there being first and second locking pin receiving slots formed in said side surfaces below and at a predetermined angle with respect to said guide slots;

(b) an elongated operating rod disposed in said longitudinally extending guide track in said receiver member for reciprocating motion therein;

(c) a bolt carrier coupled to said operating rod and having first and second, parallel and spaced apart fingers adapted to pass along said first and second guide slots in said receiver member as said operating rod is moved;

(d) a bolt member disposed between said first and second fingers of said bolt carrier and coupled to said operating rod for movement therewith; and

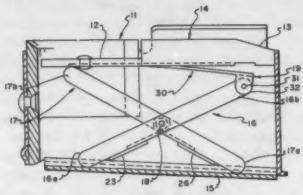
(e) a locking pin extending transversely to said longitudinally extending guide track and passing through said first and second locking pin receiving slots in said receiver member.

**4,213,262**

**BOX MAGAZINE FOLLOWER SYSTEM**

**Joseph A. Badali, Mountain Green, Utah, assignor to Browning Arms Company, Morgan, Utah**

**Filed Sep. 19, 1978, Ser. No. 943,700**
**Int. Cl.[3] F41C *25/02***
**U.S. Cl. 42—50** **4 Claims**



1. A magazine follower assembly, comprising:

a magazine box adapted to receive cartridges through its top and including a floor plate;

a first strut oriented diagonally within said magazine box with a lower end slidably supported by said floor plate and an upper end;

a second strut oriented diagonally within said magazine to effect an intersection with said first strut, pivotally connected to said first strut at said intersection, said second strut also having a lower end supported by said floor plate and an upper end;

spring means biasing said struts to pivot so that their corresponding upper ends move toward each other, thereby causing said upper ends to lift with respect to said floor plate; and

a follower member, including a first element oriented approximately horizontally with respect to said magazine box, and a second element pivotally connected to the upper end of one said strut and connected to said first element in the vicinity of the upper end of the other said strut, within said magazine box such that its orientation remains approximately horizontal within said box when it is pushed down towards said floor plate.

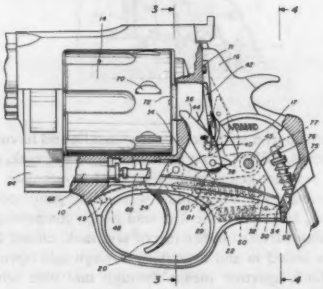
---

**4,213,263**

**FIREARM TRIGGER GUARD ASSEMBLY**

**Paul E. Brouthers, Monson, Mass., assignor to D.W.A. Associates, Inc., Monson, Mass.**

**Filed Jun. 8, 1978, Ser. No. 913,644**
**Int. Cl.[2] F41C *1/00***
**U.S. Cl. 42—59** **10 Claims**



1. For a firearm having a frame, trigger and hammer, the improvement of a removable trigger guard assembly comprising, a trigger guard frame having means for pivotally support-

ing said trigger, lug and socket means at the front of said trigger guard frame for providing a first support point for the trigger guard assembly to the frame, a biased plunger at the rear of said trigger guard assembly having a wedged end coacting with a slot in the frame for providing a second support point for the trigger guard assembly, said trigger guard frame having ear means at a top of the trigger guard frame adapted to fit within a recess in the frame, and means extending through the ear means, the frame and a base of the hammer to pivotally support the hammer and provide a third support point for the trigger guard assembly.

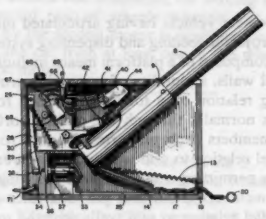
---

**4,213,264**

## AUTOMATIC FISHING APPARATUS

**James W. Robinson, Jr., 109 Lake Mead Dr., Henderson, Nev. 89015**

**Filed Oct. 19, 1978, Ser. No. 952,713**
**Int. Cl.³ A01K *91/06***
**U.S. Cl. 43—16** **7 Claims**



1. Automatic fishing apparatus comprising a housing, a pivotally mounted rod-holding tube, a pivoted sleeve mounted substantially coaxially to the tube and movable relative thereto, the tube and sleeve being movable between a cocked position and a released position, first biasing means for urging the sleeve toward the released position, latch means for maintaining the sleeve in the cocked position, second biasing means for urging the rod-holding tube into the released position, and trigger means actuated by movement of the rod-holding tube to release the latch means.

---

**4,213,265**

## EXPLOSIVE TRAP FOR ANIMALS

**Claude Denninger, Chazay d'Azergues, and Louis Moutton, Craponne, both of France, assignors to SOGEMARIC, Societe de Gestion et de Marketing pour Industries de Consommation, Ecully, France**

**Filed Sep. 6, 1978, Ser. No. 940,143**
**Claims priority, application France, Sep. 19, 1977, 77 28677**
**Int. Cl.² A01M *27/00***
**U.S. Cl. 43—84** **10 Claims**

1. An electrically fired explosive animal trap consisting essentially of:

(a) an open-ended, protective tubular envelope which is adapted to be placed inside an animal run, the diameter of said envelope being greater than its length,

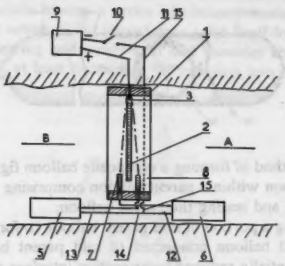
(b) a displaceable trigger and movable electrical contact of which at least part is composed of an electrically conductive material disposed within and positioned in the central part of the protective envelope and which is capable of being displaced inside the protective envelope from a central position towards two end positions situated on either side of the central position,

(c) two electrically fired deflagrating explosive charges each disposed externally of one of the ends of the protective envelope,

(d) two electrical contact stops of an electrically conductive material which are integral with and disposed within the protective envelope on either side of the trigger so that part of the displaceable central trigger which is made of electrically conductive material comes into contact with one or other of these stops when the trigger moves from the central position into one or other of the end positions situated on either side of this central position,

(e) a source of electrical energy, and

(f) an electrical circuit connecting together the electrically



conductive part of the trigger, the explosive charges, the electrical contact stops and the source of electrical energy, and wired so that the action of an animal on any of the faces of the central trigger results in closure of said electrical circuit and in firing of the explosive charge situated on that side of the trigger where the animal has exerted such action.

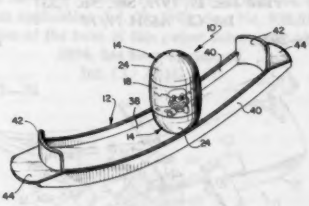
---

**4,213,266**

## TUMBLING TOY

**Joseph F. Hyland; Barbara B. Hyland, both of Ridgewood, N.J.; A. Edward Fogarty; Bonnie R. Fogarty, both of Sarasota, Fla., and Frank A. Spinale, N. Attleboro, Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.**

**Filed Feb. 21, 1978, Ser. No. 879,908**
**Int. Cl.² A63H *33/00, 15/08*; A63B *37/00***
**U.S. Cl. 46—1 R** **13 Claims**



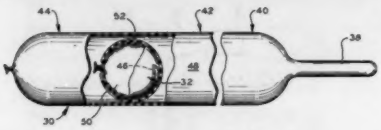
1. A tumbling toy, comprising a hollow housing that includes spaced, opposed end caps and an outer cylindrical sleeve located therebetween, each of said end caps having a hemispherical configuration that includes a rounded end wall, an inner tubular member located within said outer sleeve in coaxial relation thereto and being secured at the ends thereof to said end caps, the opposed ends of said inner tubular member extending inwardly within the opposed end caps for engagement with an interior portion of said end caps, and a weighted ball captured within said inner tubular member and end caps and having rolling movement between said end caps to produce a tumbling end-over-end action for said housing when an exterior force is applied thereto, or when said toy is placed on a downwardly inclined surface.

**4,213,267**

## COMPOSITE BALLOON FIGURE AND METHOD OF MAKING THE SAME

**Eugene E. Curtis, 708 S. Byrne Rd., Toledo, Ohio 43609**

**Filed Jan. 2, 1979, Ser. No. 1**
**Int. Cl.² A63H *3/06***
**U.S. Cl. 46—87** **3 Claims**



1. A method of forming a composite balloon figure having a small balloon within a parent balloon comprising the steps of:
inflating and sealing the parent balloon;
squeezing a portion of said parent balloon to form a discrete second balloon connected to said parent balloon by a substantially reduced cross-section interface region;
substantially sealing said interface region by compressing said interface region;
moving said second balloon inwardly into said parent balloon until said second balloon is entirely encased by said parent balloon;
tearing the skin of said parent balloon that is disposed adjacent to the outer end of the inserted second balloon to disengage said second balloon from said parent balloon with said second balloon remaining within said parent balloon; and
sealing said parent balloon adjacent said torn skin portion with said second balloon therein.

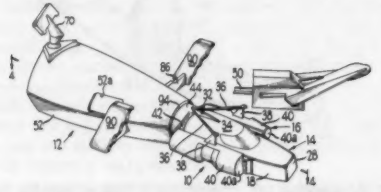
---

**4,213,268**

## MULTI-STAGE VEHICLE TOY

**Erick E. Erickson, Chicago; John R. Wildman, North Riverside, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Jan. 29, 1979, Ser. No. 7,337**
**Int. Cl.² A63H *17/14***
**U.S. Cl. 46—202** **13 Claims**



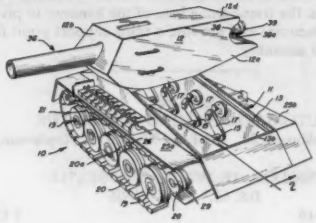
1. A toy vehicle comprising:
a front portion including wheel means for supporting the same for rolling movement over a support surface;
a separate rear portion including wheel means for supporting the same for rolling movement over said support surface;
biasing means for ejecting said front portion away from said rear portion and means for connecting said biasing means to said vehicle;
detachable connector means for securing said front and rear portions nested together as a unit against the force of said biasing means until said unit is impacted in a forward direction to travel on said support surface.

**4,213,269**

## AMUSEMENT VEHICLE

**Charles J. Grogg, Sr., 2964 Sunflower St., Thousand Oaks, Calif. 91360**

**Filed Mar. 3, 1978, Ser. No. 883,210**
**Int. Cl.² A63H *17/04***
**U.S. Cl. 46—219** **10 Claims**



1. An amusement vehicle having articulated multi-element tracks and a projectile feeding and dispensing system comprising; a chassis composed of a platform means including a pair of spaced parallel walls, a plurality of suspension arms each carried in trailing relation by a torsionally biased rotatable pin which extends normally through the middle portion of said walls, roller members each supported for free rotary movement in parallel relation to said walls at the arm end opposite said pin end for permitting controlled arcuate swinging motion of said roller members about said pin axis, idler means supported in parallel relation to said walls near the topmost section thereof for rotary movement, track means composed of articulated links hingeably interconnected along an elongated part of each for forming a chain loop to run about said roller members and said idler means as a pair of tracks each extending normally to one of said walls and said biased suspension arms acting to tension said tracks, resilient means connected between the said pins and said walls for urging each said arms carried thereon to bias said roller members carried thereby into engagement with the inner circumference of said track, a hollow enclosure supported for pivotal movement relative to said platform means for containing a projectile dispenser including an aiming device of tubular configuration having a companion plunger for permitting sliding mating inter engagement therebetween, force means connected between said plunger and said enclosure for selectively driving said plunger in said aiming device to propel projectiles therein through said device at increasing velocity, a supply means carried atop said hollow enclosure for containing and feeding projectiles to said plunger aiming device when said plunger for same is drawn to a cocked position, interconnecting means between said plunger and a projectile transportation means carried for shuttled movements upon said supply means to push each projectile from the containing portion of said supply means along a feeding channel for receipt therefrom in the breech of said aiming device as said plunger is drawn to its fully cocked position.

---

**4,213,270**

## RADIO CONTROLLED WHEEL TOY

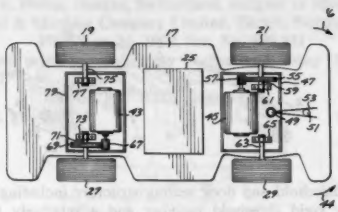
**Nobuo Oda, 2-26-12 Noge, Setagayaku,Tokyo, Japan**

**Filed Aug. 7, 1978, Ser. No. 931,936**
**Int. Cl.² A63H *30/04***
**U.S. Cl. 46—254** **9 Claims**

1. A radio-controlled wheel toy having a first pair and a second pair of wheels wherein a hand-held transmitter with a manually manipulateable means therein transmits signals to a receiver mounted on a support platform of the wheel toy for controlling the direction of movement of said wheel toy, the improvement therein comprising: p1 said first pair of wheels rotatably mounted on a wheel platform, said platform being

mounted for pivotal movement relative to said support platform of the wheel toy;

a first motor means mounted on said wheel platform in proximity to said first pair of wheels and connected for driving one of said pair of wheels; and



a second motor means mounted in proximity to said second pair of wheels and connected for driving at least one of said second pair of wheels wherein the wheel that is driven by the second motor is positioned on the opposite side of the car from at least one of the wheels driven by said first motor.

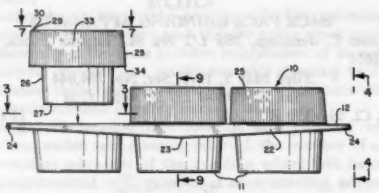
---

**4,213,271**

## PLANTER

**Thomas G. Petruzzi, Orlando, Fla.; Harold P. Ashton, Providence, R.I., and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.**

**Filed May 3, 1979, Ser. No. 35,741**
**Int. Cl.³ A01G 9/02**
**U.S. Cl. 47—39** **9 Claims**



1. A planter including a combined tray support and vessel wherein said tray support incorporates at least one compartment formed by a base and upstanding wall arrangement and a peripheral flange portion positioned about said compartment intermediate the longitudinal extent thereof, said vessel being formed by a side wall structure, an integral bottom wall having at least one opening therethrough and a skirt affixed to said side wall structure and positioned such that a terminal edge thereof lies in a plane intermediate said bottom wall and the top edge of said side wall structure, said skirt being in close juxtaposition about said compartment above said terminal edge in abutment with said flange portion and said side wall structure and bottom wall being within said compartment and in juxtaposition with said upstanding wall arrangement and base respectively.

---

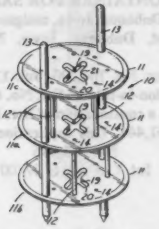
**4,213,272**

## DEVICE FOR SUPPORTING TOMATO PLANTS

**Frank J. Nievelt, 423 S. Campbell, Royal Oak, Mich. 48067**

**Filed Aug. 2, 1978, Ser. No. 930,378**
**Int. Cl.² A01G 17/06**
**U.S. Cl. 47—45** **2 Claims**

1. A device for use with growing tomatoes vines comprising a series of horizontal light transmitting plates spaced vertically to form at least three tiers, each plate having a circular periphery and a substantially imperforate solid surface extending inwardly therefrom to near the center thereof with a central opening through which the tomato vine stalk may grow upwardly with its side tomato bearing shoots spreading outwardly and laterally over the upper surfaces of the plates, said plates forming supporting shelves for the entire area between said central opening and the outer periphery, a series of vertical struts between the plates of each tier, each strut having a portion of reduced diameter with an intermediate shoulder, said plates each having a series of circumferentially spaced holes in the substantially imperforate solid shelf-forming surface for receiving said struts with said shoulder abutting said solid surface, at least two stakes for insertion into the ground,



each of said stakes extending through each of said plates, said central opening in said plates being substantially less than one-third the diameter of said plate permitting vertical growth therethrough of the vines and support of the lateral growth and the tomatoes developed on said vines by said plates; in which each of said plates is substantially the same as the others, with eight circumferentially spaced holes, there being four struts between each tier with said reduced end portions inserted in alternate of the eight holes in the first tier, the four struts in the next adjacent tier being inserted in the unfilled holes of said first tier, and wherein also the cut out portions in each plate are star shaped and in vertical alignment.

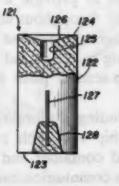
---

**4,213,273**

## FIELD TRANSPLANT SYSTEMS AND METHODS AND COMPONENTS THEREOF

**Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.**

**Division of Ser. No. 772,094, Feb. 25, 1977, Pat. No. 4,130,072.**
**This application Jul. 28, 1978, Ser. No. 928,839**
**The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.**
**Int. Cl.² A01G 9/02**
**U.S. Cl. 47—74** **7 Claims**



1. A polymerized soil plug for growing a plant therein from seed comprising a body of spongy open-celled hydrophilic polymer, a quantity of particles of soil mix distributed throughout said body of spongy polymer, and a quantity of foam-forming synthetic organic plastic resin being reacted in situ to form said body of spongy open-celled hydrophilic polymer binding said particles of soil mix therein and into a cohesive soil plug, said resin comprising from about 20% to about 80% by dry weight of said soil plug thereby to provide a unitary self-supporting polymerized soil plug, said soil plug having a generally

longitudinally extending side wall and generally transversely extending end walls, one of said end walls having a seed receiving recess therein with the end wall sloping from adjacent to the periphery of said soil plug inwardly toward said seed recess, said inwardly sloping wall directing fluids into said seed recess during germination of the seeds therein.

---

**4,213,274**

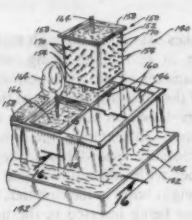
## AERATED CONTINUOUSLY WATERED PLANT AND SEED ORGANIC GROWING MEDIUM AND CONTAINER FOR SAME

**William A. Skaife, Dubuque, Iowa, assignor to Vivian A. Skaife, Irrevocable Trust, Dubuque, Iowa, Margaret R. Skaife, Trustee**

**Continuation of Ser. No. 704,190, Jul. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 693,637, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 577,863, May 15, 1970, Pat. No. 3,961,444. This application Dec. 22, 1977, Ser. No. 863,086**

**Int. Cl.[2] A01G *27/00***

**U.S. Cl. 47—81** **5 Claims**



1. A potted growing medium adapted for all seed and plants growing together at the ame time which is continuously aerated and watered comprising,

a pot container having a wall,

a growing medium in said container, said growing medium being sufficiently porous to allow air to freely circulate therethrough and having properties allowing capillary action to transmit water throughout the growing medium,

an unregulated water supply in continuous contact with said growing medium fully supplying said growing medium with as much water as it will naturally hold to substantially saturate said growing medium and maintain it in a substantially saturated condition throughout,

a fresh air source in continuous communication with said growing medium to provide a substantially continuous supply of fresh air throughout said growing medium with said air having been humidified by passing through said saturated growing medium and thereby supplying fresh humidified air to seed or plant roots in the growing medium,

said container including a plurality of pots in side-by-side spaced relationship and each pot including a growing medium and said container and water supply including standing water in communication with the bottom of each of said growing mediums through openings in the bottom of said pots, and

said container further including a plurality of side-by-side chambers in which said pots are positioned and each of said pots being smaller than said chamber to provide an air space between said chamber wall and said pot wall with said air source being in communication with said air space and said pot wall having openings in its substantial area for placing said growing medium in communication with said air chamber whereby plant roots have access to humid air.

---

**4,213,275**

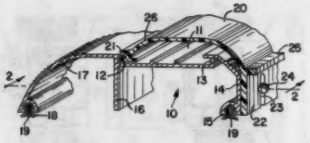
## THRESHOLD AND DOOR SEALING STRUCTURE

**Robert G. Oehmig, 1921 NE. 150th St., N. Miami, Fla. 33181**

**Filed Apr. 2, 1979, Ser. No. 25,898**

**Int. Cl.[2] E06B *1/70***

**U.S. Cl. 49—468** **5 Claims**



1. A threshold and door sealing structure including a substantially rigid threshold member and a relatively flexible sealing member, said threshold member having at least one undercut groove adjacent a top surface thereof and at least one depending flange, said flange being located at one side of the threshold member spaced from said groove, said sealing member having a flange along one edge thereof secured in said undercut groove, said sealing member extending upwardly and over the threshold member and downwardly over said depending flange, fastening members securing the sealing member to said depending flange, the sealing member being vertically adjustable relative to said fastenings, the portion of the sealing member extending downwardly over said depending flange comprising a vertical wall of substantially greater thickness than the portion extending over the threshold member and of substantially greater stiffness than such last-named portion, and an outstanding flange on said vertical wall adjacent the top thereof.

---

**4,213,276**

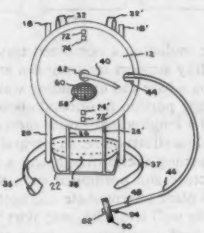
## BACK PACK GRINDING APPARATUS

**Garman C. Jennings, 386 1/2 3rd St., Laguna Beach, Calif. 92651**

**Filed May 9, 1977, Ser. No. 794,844**

**Int. Cl.[2] B24B *23/02*; A45F *3/04***

**U.S. Cl. 51—170 R** **12 Claims**



1. A portable grinding apparatus comprising:

a frame defined by parallel standards and interconnected cross bars with interconnectable strap means to permit securing said frame on the back of an operator;

a support plate peripherally secured to said frame;

a base plate rotatably mounted on said support plate and parallel thereto to permit its complete rotation in a plane substantially parallel to the back of said operator;

motor means secured to said base plate;

flexible shaft means extending from said motor to a remote distally attached abrasion means;

handle means distally carried on said flexible shaft means adjacent said abrasion means; and

detachable lock means carried on said frame and engaging said base plate to fixedly secure said base plate against rotation whereby said base plate can be released to permit

the operator to rotate said plate and shift said flexible shaft and abrasion means from side to side.

---

**4,213,277**

## METHOD FOR DRESSING A GRINDING WHEEL

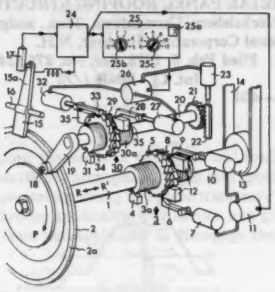
**Daniel A. Fivian, Horgen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland**

**Filed Apr. 24, 1978, Ser. No. 899,221**

**Claims priority, application Switzerland, May 5, 1977, 5626/77**

**Int. Cl.² B24B *1/00, 53/00***

**U.S. Cl. 51—325** **6 Claims**



1. A method for the intermittent dressing of an active rim of an axially displaceable dished grinding wheel of a gear grinding machine and which active rim machines a workpiece, comprising the steps of:

controlling the position of the active rim of the grinding wheel;

adjusting the position of the grinding wheel by a number of compensating advances such that the active rim is retained essentially at the same location independent of its wear,

employing at least one axially movable dressing tool for dressing the active rim of the grinding wheel once within a predetermined dressing interval; and

feeding said dressing tool towards said grinding wheel when, within said dressing interval, the number of compensating advances of the grinding wheel falls below a predetermined total number of compensating advances, said dressing tool being fed towards said grinding wheel an amount corresponding to the amount by which the number of compensating advances of the grinding wheel falls below said predetermined total number of compensating advances.

---

**4,213,278**

## CYLINDRICAL CLAMPING MANDREL FOR A BUFFING OR POLISHING PAD OF SPECIFIC SIZE

**Walter Oberer, Käferholzstr. 167, CH-8046 Zürich, Switzerland**

**Filed Jun. 2, 1978, Ser. No. 911,946**

**Claims priority, application Switzerland, Jun. 2, 1977, 6829/77**

**Int. Cl.² B24B *5/46***

**U.S. Cl. 51—368** **4 Claims**

1. A cylindrical buffing or polishing mandrel comprising; a hollow cylinder (A) having a clamping shaft portion (Ab), a continuous bore (Aa,Ac) therethrough that is centrally located, and a longitudinal slot (Ad) in communication with said bore (Ac) and extending diametrically of said hollow cylinder; said bore having a greater diameter portion (Aa) in the region beyond said longitudinal slot; a clamping mandrel rotatably disposed in said bore and including a stud portion (Bc) rotatably connected in the greater diameter portion (Aa) of said continuous bore, and a thin clamping pin portion (B) having a width greater than the thickness thereof extending forwardly from said stud portion in said bore (Ac) adjacent said longitudinal slot (Ad) substantially throughout the length thereof, the width of said clamping pin portion being slightly less than the diameter of said bore (Ac) adjacent said longitudinal slot; a polishing pad (E) extending around said hollow cylinder (A) and having opposite ends (Ea) extending inwardly across substantially the entire diametrical length of said longitudinal slot (Ad) and the polishing surfaces thereof positioned on opposite sides of said clamping pin portion; and said clamping

pin portion having beveled knife-like edges forming knife-like gripping points (Be) along the opposite longitudinal edges thereof adapted to penetrate the polishing surfaces of said opposite ends (Ea) substantially along a plane through the axis of said bore (Ac) and at right angles to said longitudinal slot (Ad) to clamp the ends (Ea) of said polishing pad against the surface of said bore (Ac) when said clamping mandrel is rotated in said bore.

---

**4,213,279**

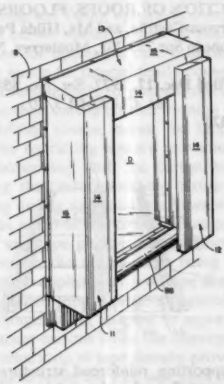
## DOCK SEAL FOR BUILDING DOORWAY

**Richard C. Layne, 155 Superior St., Marion, Ohio 43302**

**Filed Aug. 9, 1978, Ser. No. 932,205**

**Int. Cl.² E06B *7/23, 9/00***

**U.S. Cl. 52—173 DS** **10 Claims**



1. A dock seal for use around a door opening having substantially vertical jambs and a horizontal header, said seal comprising a resiliently flexible and compressible seal member of L-shape form, having attaching means at one of its edges for attaching the seal member at a jamb to support the seal with an inner flange extending forwardly outwardly from the jamb and with a laterally extending outer flange which is adapted to project over the opening so as to be engaged by a backing vehicle to be loaded or unloaded through the door opening, said inner flange extending sufficiently outwardly from the

jamb to position said outer flange sufficiently away from the jamb to permit a vehicle to be backed against the jamb and bend the laterally projecting flange rearwardly and outwardly away from the vehicle opening to wipe against and hug the side of the vehicle.

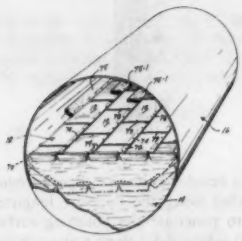
---

**4,213,280**

## MODULAR UNIT FOR THE CONSTRUCTION OF FLOATING DECKS OF LIQUID STORAGE TANKS

**Edmund B. Sandborn, Burlington, Canada, assignor to Novaro Investments Limited, Montreal, Canada**

**Filed Sep. 6, 1978, Ser. No. 939,961**
**Int. Cl.[2] B65D *87/20*; E04C *2/26***
**U.S. Cl. 52—309.9** **12 Claims**



1. A modular unit for use in the building of a floating deck used for controlling liquid evaporation in a liquid storage tank, said unit comprising:

a rigid cellular foam plastic core, and;

an envelope sealingly encasing said core defining a barrier against liquid or vapor absorption in said core, said envelope comprising a layer of electrically conductive flexible metal and a layer of plastic material located directly between said metal and said core of foam plastic to provide an increased bond between said core and said metal.

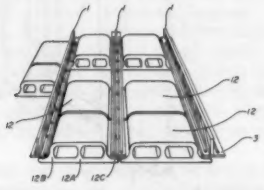
---

**4,213,281**

## CONSTRUCTION OF ROOFS, FLOORS AND BEAMS

**Agustin F. Zarzosa-Castilla, and Ma. Hilda Parcero-de Zarzosa, both of Escobedo Sur 733-201, Monterrey, Nuevo Leon, Mexico**

**Filed Dec. 12, 1977, Ser. No. 859,467**
**Int. Cl.[2] E04B *5/30***
**U.S. Cl. 52—323** **1 Claim**



1. A self-supporting reinforced structure for reinforcing concrete roofs and floor forming a beam with hollows comprising, in combination, a pair of bolster beams disposed in spaced relationship, a plurality of crossbars extending between the bolster beams securedly joining the bolster beams together, rib means disposed on the top of the crossbars and secured thereto for providing structural strength to the beam, and counter brace means for supporting the beam and providing structural strength to the beam so that said beam is self-supporting after an agglutinatable filler material has been poured over the beam prior to the time said filler material becomes partially agglutinated, and a pair of hollow filler block elements disposed in spaced relationship, each of said filler elements having a respective extension, said extensions of two adjacent filler elements comprising substantially flat surfaces extending toward and disposed proximally adjacent each other to form a hollow for receiving said counter brace and beams thereon and for receiving thereover filler material poured into the hollow, said counter brace means being engagingly supported before filling said hollow solely by the flat surfaces of said extensions, thereby providing said additional strength enabling the pouring of the filler material to be accomplished without using other counter braces.

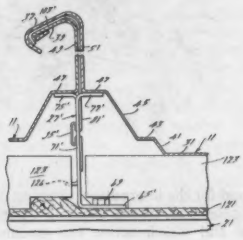
---

**4,213,282**

## METAL PANEL ROOFING STRUCTURE

**Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.**

**Filed Feb. 6, 1978, Ser. No. 875,524**
**Int. Cl.[2] E04B *1/76***
**U.S. Cl. 52—404** **5 Claims**



1. In a roof structure having horizontally extending support purlins, the combination of a plurality of elongated roof panels located side by side and supported on said purlins, the lengths of said panels extending transversely to the lengths of said purlins, adjacent panels having edges interlocked with each other to form joints that join the panels together, an insulative layer supported on said purlins between and in contact with said panels and purlins and covering substantially the same total area as said panels, panel mounting clips having upwardly projecting tab portions secured to said panels and base portions bearing against the upper side of said insulative layer and secured to said purlins to provide means for attaching the panels to the purlins, said tab portions extending into said joints to mechanically secure said clip to said adjacent panels, means flexibly attaching said tab portions to said base portions in relatively movable relationship to provide for movement of said panels relative to said purlins, and insulative thermal blocks extending lengthwise of and directly over said purlins and bearing against the upper side of said insulative layer on said purlins, said blocks extended between the base portions of adjacent panel mounting clips, said base portions having tangs thereon which project into ends of said thermal blocks holding said blocks in place, said panels being supported on the tops of said thermal blocks.

---

**4,213,283**

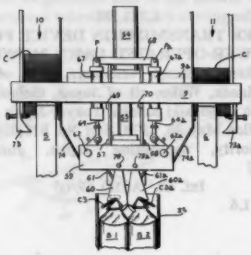
## MACHINE FOR APPLYING AN ARTICLE CARRIER TO A PLURALITY OF BOTTLES

**Rodney K. Calvert, Dunwoody; Dale K. Scott, Jonesboro, and Alton J. Fishback, Austell, all of Ga., assignors to The Mead Corporation, Dayton, Ohio**

**Filed Nov. 15, 1978, Ser. No. 960,736**
**Int. Cl.[3] B65B *21/00***
**U.S. Cl. 53—48** **15 Claims**

1. A machine for applying an article carrier having apertures therein to a row of bottles to cause the neck of each bottle to be enveloped by a carrier aperture, said machine comprising conveyor means (4) for moving a group of bottles arranged in

side by side relationship into a loading station, vertically reciprocable plunger means (55,59) disposed above said loading station, at least one applicator member (60) pivotally mounted on said plunger means and disposed to receive carriers in sequence and movable downwardly to cause the carrier aper-



tures to envelope the necks of bottles at said loading station, and cam means (80,81) arranged to swing said applicator member about its pivotal mounting in a plane transverse to said row of bottles following application of a carrier to a group of bottles so as to cause said applicator to disengage the carrier.

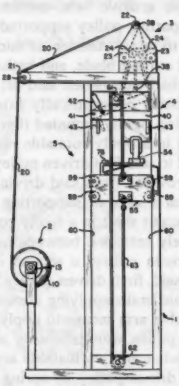
---

**4,213,284**

## AUTOMATIC BAGGING APPARATUS

**John H. Silverman, Nesconset, N.Y., and James P. Cahill, River Vale, N.J., assignors to Precise Metal Parts Company, Emerson, N.Y.**

**Filed Jan. 24, 1979, Ser. No. 6,281**
**Int. Cl.² B65B** *57/12, 43/46*
**U.S. Cl. 53—74** **13 Claims**



1. In an apparatus for repeatedly forming garment bags, each bag formed about a garment on a hanger with a hook, each bag formed from a length of tubular heat sealable material pulled and cut free from a supply roll of said material, said apparatus being the type which includes a support for holding said hanger mounted garment in position for bagging, a supply roll holder which permits rotation of said roll, a pulling means including a motor drive for advancing said tubular material by pulling said tube length from said roll along a path of movement and over said garment, a cutting means for transversely cutting free said tube length, and heat seal means for effecting a transverse closure of said tube length with said support extending through said closure, the improvement comprising:

(a) an anti pull-back means proximate said support on the side thereof towards said supply roll holder for preventing pull-back of said tubular heat sealable material after each said length thereof has been cut free;

(b) brake means for restraining rotation of said supply roll when said roll is within said holder;

(c) means for deactivating said brake means when said pulling means is activated;

(d) means for controlling said pulling means to limit the linear acceleration of said tubular material during pulling; and

(e) a flywheel connected to said supply roll for rotation therewith when said roll is within said holder, whereby as said supply roll is diminished by each pull of a tube length, the portion of the pulling force necessary to rotationally accelerate said diminished supply roll is decreased but, since the required angular acceleration of said diminished supply roll is increased, the regular acceleration of said fixed inertia flywheel is likewise increased to substantially correspondingly require an increase in another portion of said pulling force to maintain said total pulling force substantially constant.

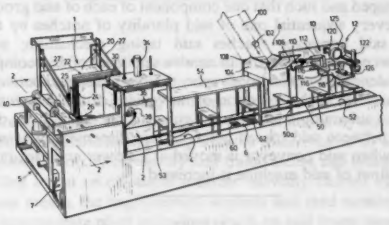
---

**4,213,285**

## CARTONING APPARATUS

**Derek V. Mancini, Etobicoke, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada**

**Filed Oct. 31, 1978, Ser. No. 956,246**
**Int. Cl.² B65B** *7/20, 43/28*
**U.S. Cl. 53—137** **13 Claims**



8. Carton forming and filling apparatus comprising: means for supplying flat carton blanks to a set-up station; means for loading and means for opening a carton blank in the set-up station; conveyor means for intermittently conveying the open carton blanks and subsequently formed cartons in fixed spaced relation to one another; carton bottom forming means consisting of bottom folding means; means for taping the folded bottoms, means for restricting upward movement of the open carton blanks cooperating with the carton bottom forming means in forming the carton bottoms; carton filling means; carton top folding means; and top taping means for taping the folded carton tops, either of said taping means comprises a tape contact member and tape plunger means downstream of the tape contact member; the arrangement being such that said tape contact member applies a strip of tape along and extending between the folded tops of adjacent spaced apart cartons with said tape plunger being adapted to move into the space between the adjacent cartons when the conveyor is stationary to sever the extended strip of tape thereby provideing a pair of free tape ends and to apply the free tape ends to opposing end walls of the adjacent cartons.

---

**4,213,286**

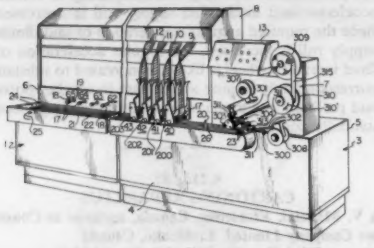
## COMPONENT SEQUENCING AND TAPING MACHINE

**Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.**

**Filed Aug. 21, 1978, Ser. No. 935,619**
**Int. Cl.² B65B** *57/10, 13/04, 27/10*
**U.S. Cl. 53—493** **3 Claims**

1. A machine for increased rate of sequencing and taping

electrical components said components being characterized by having a body portion and at least one lead extending from each end of said body portion, which comprises in combination: a continuous conveyor movable along a horizontal path at a constant rate; a group of dispensers, dispensers of said group being disposed at spaced points along the path of travel of said conveyor; means for actuating said dispensers; a taping mechanism adapted to apply tape to components deposited on said conveyor by said dispensers, said conveyor and said taping mechanism being adapted to run continuously; and control means, said control means including memory means adapted to control operation of said actuating means such that said dispensers of said group are actuated in a preferred sequence to deposit components into a plurality of notches of said conveyor to form successive predetermined groups of components to be taped and such that one component of each of said groups is in every sequential one of said plurality of notches by the time said conveyor reaches said taping mechanism; said notches opening upwardly to receive said leads of said components deposited on said conveyor, the pitch distance between said notches in the direction of movement of said conveyor being a submultiple less than or equal to one-fifth of the distance between said spaced points of said dispensers, whereby even when said conveyor is moved at a slower constant rate, the output of said machine is increased.



---

**4,213,287**

## FILLING MACHINE FOR VALVE BAGS

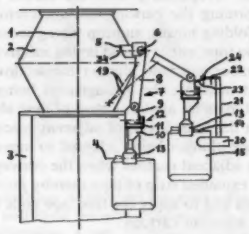
**Günter Knorr, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Hamburg, Fed. Rep. of Germany**

**Filed Apr. 13, 1979, Ser. No. 29,893**

**Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817436; May 24, 1978, 2822678**

**Int. Cl.[2] B65B *43/26***

**U.S. Cl. 53—573** **19 Claims**



1. A filling machine for filling bags, comprising

a rotor having a plurality of filling stations and

a delivery arm for each station, the delivery arms each having a gripping device for gripping the bags and being movable relative to a stationary magazine for the bags, and including an articulated section operable to compensate for the rotational speed of the rotor and arms relative to the magazine, whereby the gripping device is caused to move in a direction opposite to the direction of approach to the magazine so that the relative movement between the gripping device and a bag at the magazine is very low during gripping of the bag, thus facilitating accurate gripping of the bag.

---

**4,213,288**

## POWER TRANSMISSION DEVICE FOR A POWER-OPERATED LAWN MOWER

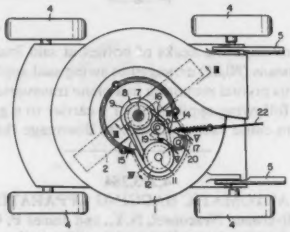
**Masayuki Takeuchi; Kenji Nakamura, both of Asaka, and Masahiro Handa, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 30, 1978, Ser. No. 910,526**

**Claims priority, application Japan, Jun. 2, 1977, 52/5270757[U]**

**Int. Cl.[2] A01D *69/08***

**U.S. Cl. 56—11.6** **1 Claim**



1. In a power transmission device for a power-operated lawn mower having a steering handle, a main body housing, a prime mover, an output shaft extending from said prime mover to transmit driving force thereof, a driving pulley, a driven pulley, a cutting blade, a drive belt, oscillatable control arm means, a tension-imparting pulley supported at one end of the control arm means to impart tension to said drive belt at the time of driving said cutting blade, and brake applying means, the improvement which comprises: said driving pulley and a first driven pulley being concentrically fitted on said output shaft, the former being rigidly mounted thereon and the latter being fitted thereon in a freely rotatable manner; the cutting blade being fastened to said first driven pulley; a second driven pulley separately provided from said driving pulley and said first driven pulley on a separate supporting shaft disposed in parallel with said output shaft in a freely rotatable manner; a first drive belt loosely extended between said driving pulley and said second driven pulley; a second drive belt tightly extended between said first driven pulley and said second driven pulley; and said brake applying means provided on one part of said oscillatable arm means to apply braking force to said second driven pulley simultaneously with loosening of said first drive belt when said oscillatable arm means is biased toward said second driven pulley by spring force, control of said oscillatable arm means being effected by a control lever provided on said steering handle of said lawn mower to be operated by an operator through flexible means connecting said lever and said oscillatable arm means.

---

**4,213,289**

## FAN DEVICE FOR ROTARY MOWERS

**Holger Kamppinen, 428 Williams Ave. North, Renton, Wash. 98055**

**Filed May 21, 1979, Ser. No. 40,975**

**Int. Cl.[3] A01D *55/18***

**U.S. Cl. 56—295** **5 Claims**

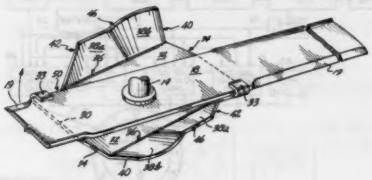
1. A fan device for use with a rotary mower blade mounted on an upright mower shaft within a mower housing, comprising:

plate structure extending laterally of said blade at each side of its axis of rotation axisward of the cutting edges of the blade;

each said plate structure providing during rotation a leading edge and a following edge;

said edges being disposed at like but opposite acute angles relative the longitudinal axis of the mower blade;

a fan blade secured axisward of each cutting edge along each



side of said plate structure and rising thereabove and above the mower blade at an obtuse angle relative the plane structure; and

said fan blades upon rotation above grass-covered earth creating an appreciable lift on the vegetation to cause the same to stand substantially upright in the path of the rotating mower blade and also producing a scouring action on the housing inner surfaces as cut airborne vegetation is moved for outward discharge from the housing.

---

**4,213,290**

## RING SPINNING FRAME WITH DRAWING MECHANISM STOP MOTION

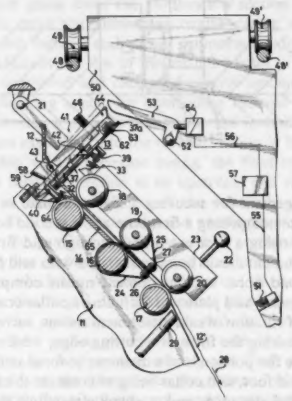
**Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany**

**Filed Aug. 18, 1978, Ser. No. 934,678**

**Claims priority, application Fed. Rep. of Germany, Aug. 20, 1977, 2737599**

**Int. Cl.² D01H *13/16***

**U.S. Cl. 57—85** **5 Claims**



1. Ring spinning machine comprising a drawing frame having, at a given location therein, a draw-up roll for drawing therethrough in a given direction a roving being spun in a thread, and a roving-clamping device responsive to a break in the thread for clamping the roving, said roving-clamping device being controllably deflectable to move the roving transversely to said given drawing direction in vicinity of said given location, said roving-clamping device being latchable in made-ready position thereof, having an unlatching device responsive to a thread break and comprising a two-part clamp including a lower clamping member spring-biased into made-ready position thereof and an upper clamping member held by said unlatching device in made-ready position against a spring-biasing force, said upper clamping member, after unlatching of said roving-clamping device, pressing the roving against said lower clamping member and deflecting both the roving and said lower clamping member transversely to said given drawing direction, and including stop means for limiting the deflection of the roving and said lower clamping member.

---

**4,213,291**

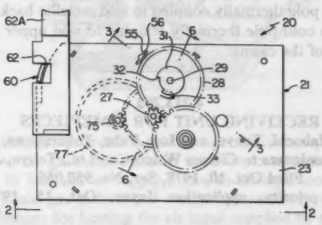
## ALARM CLOCK CONSTRUCTION

**Robert L. Wooding, Wolcott, Conn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Aug. 29, 1977, Ser. No. 828,611**

**Int. Cl.² G04C *71/16***

**U.S. Cl. 368—263** **11 Claims**



1. In an alarm clock construction having frame means carrying time means and a timer motor for driving said time means, said time means including an alarm setting means for selecting a predetermined time said clock construction is to sound an alarm, said alarm sound being adapted to be created by a reed member pivotally carried by said frame means and being controlled by an on-off alarm member movably carried by said frame means, the improvement wherein said reed member has an intermediate pivot point that pivots on said frame means to permit said reed member to pivot to an alarm producing position when said time means reaches said predetermined time, said on-off alarm member having biasing means for acting on said reed member on one side of said intermediate pivot point to tend to bias said reed member to said alarm producing position when said on-off alarm member is in the "on" position thereof and for acting on said reed member on the other side of said intermediate pivot point to tend to bias said reed member out of said alarm producing position when said on-off alarm member is in the "off" position thereof, said biasing means of said on-off alarm member comprising a leaf spring member engageable with and slidable relative to said reed member, said reed member having a slot therein that extends from one side of said pivot to the other side of said pivot point, said leaf spring member having a tang disposed in said slot to guide movement of said on-off alarm member relative to said reed member.

---

**4,213,292**

## THERMOELECTRICALLY-POWERED WRIST WATCH

**Zdenek Dolezal, and Urs J. Hof, both of Biel, Switzerland, assignors to Bulova Watch Company, Inc., Flushing, N.Y.**

**Filed Apr. 27, 1979, Ser. No. 34,012**

**Claims priority, application Switzerland, May 10, 1978, 5060/78**

**Int. Cl.² G04C *3/00*; H02J *7/00***

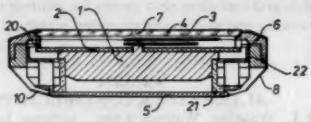
**U.S. Cl. 368—204** **9 Claims**

1. A thermoelectrically-powered wrist watch comprising:

A a casing having an upper component exposed to the atmosphere and therefore relatively cool and a back structure

provided with a metallic section in physical contact with the wrist of the wearer and heated thereby;

B an electronic watch movement housed in said casing and including a rechargeable battery to power said movement, said movement including a metallic carrier which is thermally insulated from the upper component of said casing



and is also thermally insulated from the metallic section of said back structure; and

C an electric generator disposed in said housing to produce a voltage for charging said battery, said generator having a hot pole thermally coupled to said metallic back section and a cold pole thermally coupled to said upper component of the casing.

---

**4,213,293**

**RECEIVING UNIT FOR TIMEPIECES**

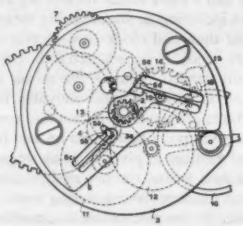
**Hiroshi Mabuchi, Tokyo, and Isao Yabe, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Oct. 10, 1978, Ser. No. 950,055**

**Claims priority, application Japan, Oct. 15, 1977, 52-138424[U]**

**Int. Cl.[2] G04B *3/12, 5/04***

**U.S. Cl. 368—152** **10 Claims**



1. In a receiving unit for timepieces arranged to support a self-winding mechanism having a weight wheel pinion secured to a weight, a reduction wheel train for transmitting the rotational movement of said weight wheel pinion to a main spring to wind up said main spring, and a control means for controlling said reduction wheel train, the improvement comprising:

(a) a bearing portion provided on and integral with said receiving unit for rotatably supporting said reduction wheel train;

(b) a cutout formed in a predetermined position of said receiving unit; and

(c) said control means including a leaf spring integral with said receiving unit and projecting into said cutout from said receiving unit and a movable member movably arranged on said receiving unit to be urged in a given direction by means of said leaf spring.

---

**4,213,294**

**ANALOG DISPLAYS FOR ELECTRONIC TIMEPIECES**

**Alfred B. Freeman, 20418 Seaboard Rd., Malibu, Calif. 90265**

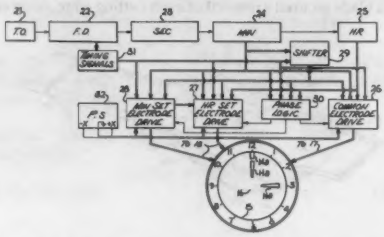
**Filed Apr. 12, 1977, Ser. No. 786,962**

**Int. Cl.[2] G04B *19/30, 19/06***

**U.S. Cl. 368—82** **22 Claims**

1. In an electronic timepiece having a time register and a time display consisting of a plurality of electro-optical elements disposed in first and second loops on the face of said timepiece, the combination of:

(a) first means responsive to the minute position held in said time register for activating one of said elements in said first loop;



(b) second means responsive to the minute position held in said time register for activating one of said elements in said second loop; and

(c) means for operating said first and second activating means in sequence repetitively at a perceptible rate.

---

**4,213,295**

**ARRANGEMENT FOR SECURING A DIAL TO A PLATE IN A TIMEPIECE**

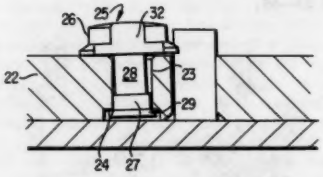
**Friedrich Perrot, Lengnau, Switzerland, assignor to ETA A.G. Ebauches-Fabrik, Solothurn, Switzerland**

**Continuation-in-part of Ser. No. 716,349, Aug. 20, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,751**

**Claims priority, application Switzerland, Sep. 12, 1975, 11855/75**

**Int. Cl.[2] G04B *19/06***

**U.S. Cl. 368—236** **1 Claim**



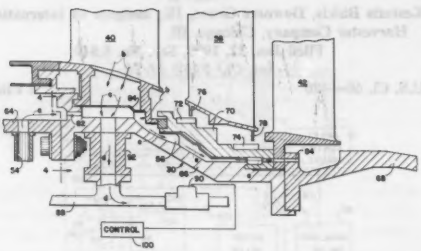
1. An arrangement for securing a dial to a plate in a timepiece, said plate comprising a first bore and a second bore, and said dial comprising a foot extending through said first bore, rotatable attachment means being associated with said foot and with said second bore, said attachment means comprising a head resting against said plate and including a collar concentric with the axis of rotation of said attachment means, surrounding said head and taking the form of a cutting edge, which except for a chordwise flat portion is of a diameter to form an interference fit with said foot, said collar being of constant thickness at any given radial distance, and a shank extending into said second bore and including a first cylindrical portion and a second cylindrical portion smaller in diameter than said first cylindrical portion, wherein said second cylindrical portion is disposed between said head and said first cylindrical portion, said shank further comprising at the end thereof remote from said head a radially projecting bead larger in diameter than said first cylindrical portion, and said plate further comprising a recess for receiving said bead, whereby said attachment means is prevented from being dislodged from said associated second bore.

4,213,296

## SEAL CLEARANCE CONTROL SYSTEM FOR A GAS TURBINE

Frederick M. Schwarz, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,748
Int. Cl.[2] F02C 7/26
U.S. Cl. 60—39.14 R 6 Claims



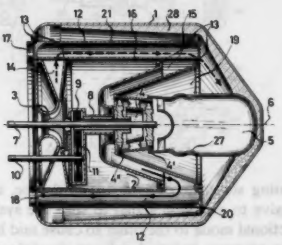

1. In a gas turbine engine having a compressor defining a flow path from which a fluid-working medium is discharged at an elevated pressure, a combustion section receiving the working medium discharged from the compressor and combining the medium with a fuel in a combustion process to generate a high-velocity stream of combustion gases, a turbine section having a turbine including a plurality of peripheral turbine blades situated in a gas flow path carrying the high-velocity combustion gases from the combustion section through the turbine to drive the turbine, an engine casing enclosing the turbine and turbine seal means supported from the casing closely adjacent the tips of the turbine blades in the gas flow path, an improved seal clearance control system comprising: heat exchanging means for controlling thermal expansion of the engine casing and the seal means and including fluid conduit means extending into the turbine section in heat exchange relationship with the engine casing, the fluid conduit means having a fluid connection at an upstream end with the compressor to receive a portion of the relatively cool working medium from the compressor and another upstream connection with the gas flow path in the turbine section to receive the relatively hot combustion gases and also having a downstream end from which the working medium and the hot combustion gases are discharged, the intermediate portion of the conduit between the upstream connection and the downstream end being in heat exchange relationship with the engine casing supporting the turbine seal means; and flow control means associated with the heat exchanging means for regulating the flow of both the relatively cool working medium and the hot combustion gases through the conduit means in heat exchange relationship with the casing whereby expansion and contraction of the engine casing and the clearance between the seal means and the blade tips in the turbine may be controlled, the flow control means including vent valve means connected with the fluid conduit means between the upstream and downstream ends for controlling pressure within the fluid conduit means and the resulting flow of the relatively cool working medium and hot combustion gases through the conduit means in heat exchange relation with the engine casing.

4,213,297

## VEHICULAR PROPULSION GAS TURBINE MOTOR

Siegfried Förster, Alsdorf; Günter Hewing, Julich, and Manfred Kleemann, Bergheim, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,245
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744899
Int. Cl.[2] F02C 7/08
U.S. Cl. 60—39.51 R 12 Claims



1. A vehicular propulsion gas turbine motor comprising, in addition to the gas turbine and its upstream combustion chamber with its fuel and air supply ducts, an air input compressor driven by said gas turbine and a counter-current recuperative heat exchanger for heating the air input supplied by said compressor with heat supplied by combustion product gases discharged by said gas turbine, said turbine, compressor, combustion chamber and heat exchanger being arranged symmetrically around a common axis of symmetry that coincides with the axes of rotation of said turbine and of said compressor, and said heat exchanger being composed of a multiplicity of ceramic elements arranged in a ring around said compressor, turbine and combustion chamber with sealing means being provided between adjacent elements, said motor further comprising the improvement which consists in that:

the ceramic elements of said heat exchanger in said annular arrangement are constituted for counter-current flow of heat exchanging gases directed mainly parallel to said axis of symmetry, although both inputs thereto are perpendicular to said axis and directed from the space within said annular arrangement toward the inner side of said elements, respectively at opposite axial ends thereof, and the compressed air path connecting with said heat exchanger communicates with confined space radially beyond said heat exchanger so that said heat exchanger elements are urged inwardly by the pressure of said compressor output, and

seals provided adjacent to the elements of said heat exchanger, including said seals between said elements, are improved by the effects of said pressure of said compressor output.

---

4,213,298

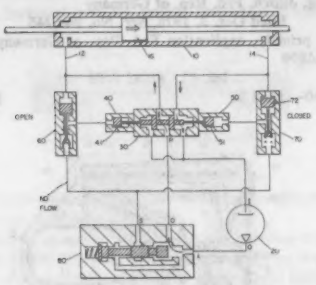
## SELF-REVERSING HYDRAULIC CONTROL SYSTEM AND SELF-REVERSING PUMP INCORPORATING SUCH SYSTEM

Jerome H. Milgram, Cambridge, Mass., assignor to Offshore Devices, Inc., Peabody, Mass.

Filed Jul. 3, 1978, Ser. No. 921,458
Int. Cl.[2] F15B 15/18
U.S. Cl. 60—369 10 Claims

1. A self-reversing hydraulic control system for use with a device to be driven in opposite directional modes, said driven device having hydraulic lines connected to its opposite sides to apply hydraulic fluid under pressure to one side of the device and apply exhaust conditions to the other side of the device, and vice versa,

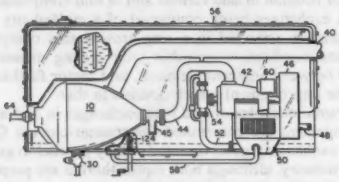
said control system including a flow sensing element disposed to sense flow associated with movement of said driven device and adapted to generate a stop signal responsive to the termination of said flow, said termination




denoting stoppage of said driven device, and means responsive to said stop signal to shift the system from one directional mode to the other to cause said hydraulic fluid under pressure and said exhaust conditions to be oppositely applied to the opposite sides of the driven device.

---

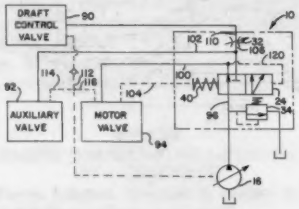
**4,213,299**
**HEAT TRANSFER LENS STEAM TURBINE**
**Stephen T. Sharar, P.O. Box 236, Woodbury, Pa. 16695**
**Filed Jul. 3, 1978, Ser. No. 921,885**
**Int. Cl.³ F01K *13/00***
**U.S. Cl. 60—676** **16 Claims**



1. A steam turbine device comprising in combination:
an outer boiler shell;
an inner boiler positioned within said outer boiler shell;
a heat transfer lens device positioned in the end portion of said inner boiler;
a jet burner device positioned in said outer boiler shell, adjacent to said heat transfer lens device and adapted to directing a flame against said heat transfer lens device;
a spraying mechanism positioned within said inner boiler adjacent to the inner portion of said heat transfer lens device, said spraying mechanism being in communication with a reservoir of fluid;
a steam delivery tube in communication with said inner boiler;
a steam pressure valve positioned within said steam delivery tube and adapted to control steam there passing through;
a steam turbine connected to said steam delivery tube;
a steam condenser connected to said steam turbine and adapted to condense steam from said turbine;
a gear reduction unit connected to said turbine adapted to convert the rotation speed of said turbine;
a combination starter-motor and generator unit connected to said turbine, said motor and generator unit connected specifically to the gear reduction unit of said steam turbine and adapted to (1) rotate said turbine for starting purposes and (2) to generate electrical energy;
a water pump connected to said condenser and in communication with said fluid-spraying mechanism;
a control mechanism associated with said water pump and adapted to control the fluid pressure output of said water pump and a water storage tank encasing said outer boiler shell and said turbine, said water tank being in communication with said condenser;
a control system adapted to monitor and control the operation of said inner boiler and said turbine.

---

**4,213,300**
**VARIABLE FLOW RATE CONTROL WITH MECHANICAL OVERRIDE FOR CLOSED CENTER VALVE**
**Kestutis Biskis, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.**
**Filed Jan. 22, 1979, Ser. No. 5,049**
**Int. Cl.² F15B *11/20***
**U.S. Cl. 60—420** **2 Claims**



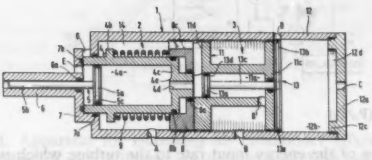

1. In an agricultural tractor having a hydraulically operated hitch control system including a position control valve, a motor valve, an auxiliary valve, a motor priority valve incorporating a variable raise rate device and a compensator adjusted variable displacement pump the priority valve assembly comprising:
a housing having a plurality of internal passages and ports including a fluid input port for receiving fluid from said variable displacement pump, a pump source passage with access to said fluid input port, a motor valve passage connected to said pump source passage, a motor valve delivery port accessing said motor valve passage to said motor valve, an auxiliary valve passage connected to said pump source passage, an auxiliary valve delivery passage accessing said auxiliary valve delivery passage to said auxiliary valve, a motor valve signal line passage connected to said motor valve, a variable orifice source passage connected to said auxiliary valve delivery passage and a variable orifice delivery passage connecting said variable orifice source passage to said draft control valve;
a priority valve spool having a multi-diameter body with a smaller diameter portion between larger diameter end portions, said priority valve spool spring and pressure biased to a first position and pressure biased to a second position, said priority valve spool being in said first position when said variable displacement pump is pumping fluid at an unrestricted rate to said motor valve passage and said priority valve spool being in said second position when said variable displacement pump is pumping fluid at a rate greater than the rate of fluid flowing through said motor valve passage;
a variable orifice interposed between said variable orifice source passage and said variable orifice delivery passage, incuding a rotary metering valve having an edge that may be rotated across an orifice connecting said variable orifice source passage with said variable orifice delivery passage to increase the area of said orifice, said variable orifice being mechanically adjustable through linkage means mounted on said rotary metering valve.

4,213,301

## COMPRESSED AIR APPARATUS FOR DRIVING FASTENING ELEMENTS

Elmar Maier, Tisis, Austria, and Othmar Heeb, Ruggell, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 27, 1979, Ser. No. 15,612
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1978, 2811083
Int. Cl.² F15B 11/06
U.S. Cl. 60—407 6 Claims



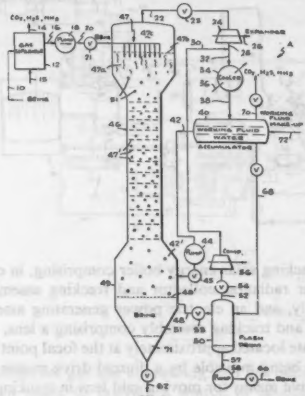
1. Apparatus for inserting fastening elements, such as bolts, nails and the like, into a receiving material using compressed air as the driving force, comprising first means defining a first axially extending chamber having a front end and a rear end spaced apart in the axial direction of the chamber, an inlet in the rear end of said chamber for supplying compressed air thereto, a first piston axially displaceably mounted within said first chamber for axial movement therethrough from the rear end toward the front end of the chamber for driving a fastening element from the apparatus, said first piston having a first piston head against which the compressed air acts, said piston head being displaceable betweeen a rear end position and a front end position, in the rear end position said piston head forming a closure for the inlet into the rear end of said chamber, second means for supplying compressed air in said chamber through the inlet in the rear end of said chamber, said second means including a second piston chamber and a third piston chamber each aligned axially with the first piston chamber with the second chamber located between the first chamber and third chamber, the second chamber being in communication with the first chamber through the inlet in the rear end of said first chamber so that compressed air can be supplied from the second chamber into said first chamber through the inlet in the rear end thereof, said third chamber having a considerably greater transverse cross-sectional area than said second chamber, said second means including a storage chamber in communication with said second chamber for storing compressed air to be used for displacing said first piston from the rear end toward the front end of said first chamber, said second means also including a double-headed piston with one head thereof located in said second chamber and the other head thereof located in said third chamber, and a piston shaft interconnecting said heads, said third chamber having a first opening thereto for admitting compressed air into the third chamber for acting against said other head, said second chamber having an opening thereto, said double-headed piston arranged to supply a sufficient amount of compressed air to said storage chamber for driving said first piston from the rear end to the front end of said first chamber, before said first piston is driven by the stored compressed air.

4,213,302

## PROCESS AND SYSTEM FOR RECOVERY OF ENERGY FROM GEOTHERMAL BRINES AND OTHER WATER CONTAINING SOURCES

Samuel G. Woinsky, Irvine, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 589,068, Jun. 23, 1975, and Ser. No. 611,310, Jun. 23, 1975, Pat. No. 4,089,175, and Ser. No. 763,533, Jan. 28, 1977. This application Sep. 26, 1977, Ser. No. 836,293
Int. Cl.² F03G 7/00
U.S. Cl. 60—641 29 Claims



1. Process for recovery of energy from elevated temperature or hot water-containing fluids which contain uncondensible gas, including geothermal brines and other elevated temperature water sources, which comprises

(a) contacting said water-containing fluid which contains uncondensible gas in heat exchange relation with a working fluid in liquid form in a heat transfer zone, to produce a cooled water-containing fluid,

(b) heating said working fluid by such contact at a temperature to produce boiling thereof in the upper portion of said heat transfer zone, said heat transfer zone being maintained at a pressure below the critical pressure of said working fluid, to produce resulting vapors of working fluid and water together with uncondensible gas,

(c) expanding the resulting vapors and gas in an expander to produce work, and discharging the expanded vapors and gas from said expander,

(d) withdrawing cooled water-containing fluid from said heat transfer zone of step (a) containing working fluid,

(e) flashing said cooled water-containing fluid of step (d) in a flash zone to flash off the working fluid therein including uncondensible gas, and leave cooled liquid, and discharging said cooled liquid,

(f) compressing the flashed-off working fluid and said gas,

(g) mixing said compressed working fluid and said gas from step (f) with the expanded vapors and gas discharged from said expander of step (c) to form a mixture,

(h) cooling said mixture and condensing the expanded working fluid vapor and water vapor therein, to form condensed working fluid and condensed water vapor,

(i) separating, in an accumulator zone, condensed working fluid from condensed water vapor and recycled uncondensible gas from step (h),

(j) returning said condensed working fluid to said heat transfer zone for reheating therein, and

(k) carrying out said flashing in step (e) of said cooled water-containing fluid at a pressure sufficiently high in relation to the pressure in said accumulator zone so that the recycle of flashed-off uncondensible gas from said flash zone

to said accumulator zone is reduced to a level such that there is essentially little or no vent gas discharged from said accumulator zone.

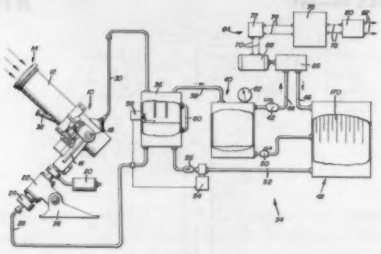
---

**4,213,303**

## SUN TRACKING SOLAR ENERGY BOILER

**William E. Lane, 1200 Central Ave., Wilmette, Ill. 60091**

**Filed Apr. 21, 1978, Ser. No. 898,876**
**Int. Cl.³ F03G 7/02**
**U.S. Cl. 60—641** **10 Claims**



1. A sun tracking solar energy boiler comprising, in combination, a solar radiation collector and tracking assembly, a boiler assembly, and an electric power generating assembly, said collector and tracking assembly comprising a lens, a hollow crown plate located approximately at the focal point of the lens, said lens being movable by a diurnal drive means and a declination drive means for moving said lens in tracking relationship with the sun, said boiler assembly comprising a preheat tank having an upper vapor-containing portion and a lower water-containing portion, a steam pressure tank connected to the upper portion of the preheat tank, a steam engine connected to the steam pressure tank with a control valve interposed therebetween, a water reservoir tank connected with said steam engine, and level control means for maintaining water in the lower portion of said preheat tank through a pump connected with said water reservoir tank, said electric power generating means being powered by said steam engine, said preheat tank having a water inlet line connecting the lower portion thereof with and furnishing water to said crown plate, said crown plate being adapted to vaporize said water into vapor passing into a steam outlet line connected with the upper portion of said preheat tank, the water level in the lower portion of said preheat tank being adjustable by said level control means to enable said water in said water inlet line to rise to a level near the rounded surface of said crown plate to permit vaporization of said water in said crown plate.

---

**4,213,304**

## BOILER CONTROL SYSTEM

**Richard H. Morse, Oreland, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.**

**Filed Nov. 24, 1978, Ser. No. 963,259**
**Int. Cl.³ F01K 3/22**
**U.S. Cl. 60—664** **9 Claims**

1. The method for controlling the boiler outlet pressure of a fuel fired drum type boiler connected to supply steam through a throttle valve to a turbine-generator, which comprises the steps of:

measuring a quantity $P_1$ indicative of the rate of energy input to the turbine;

measuring a quantity $P_t$ indicative of the actual throttle pressure;

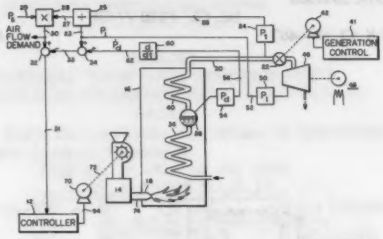
providing a quantity $P_s$ indicative of the desired throttle pressure;

measuring a quantity $P_d$ indicative of the rate of change of the drum pressure; and

controlling the fuel input to the boiler so as to vary the heat released in the boiler as represented by the expression

$$P_1+P_d$$

in accordance with a demand quantity represented by the expression




$$P_1(P_s/P_t)$$

indicative of the energy input rate to the turbine which will occur at the existing throttle valve opening when throttle pressure is at its desired value so that effectively the response of the control action to $P_s$ and $P_t$ is only to their ratio.

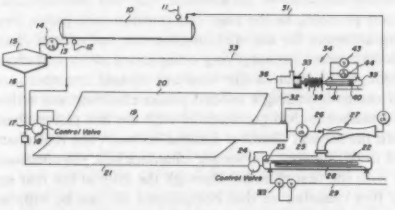
---

**4,213,305**

## SOLAR POWERED COOLING APPARATUS

**Arie M. De Geus, 6625 4th St., S., St. Petersburg, Fla. 33705**

**Filed Sep. 13, 1976, Ser. No. 941,755**
**Int. Cl.² F25B 27/00, 1/06**
**U.S. Cl. 62—2** **5 Claims**

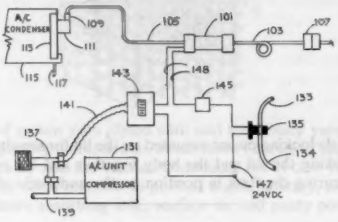



1. Solar powered cooling apparatus comprising a collector-/evaporator and reflector means positioned to concentrate incident solar radition on the collector, an evaporator forming part of a cooling device, aspirator means operated by the pressurized refrigerant vapor produced in said collector-/evaporator for reducing the pressure in the evaporator of said cooling device and thereby cooling the refrigerant liquid therein, an overhead condenser for condensing the mixture of vapors produced by said aspirator, said overhead condenser draining into an overhead gathering vessel, means for supplying liquid refrigerant from said gathering vessel to the evaporator of said cooling device, said supplying means including the head of liquid established by said gathering vessel, and means for imposing upon said head of liquid the pressure generated by said collector/evaporator, whereby said liquid refrigerant is supplied to said collector/evaporator from said gathering vessel.

## 4,213,306
## METHOD AND APPARATUS FOR INCREASING AIR CONDITIONER EFFICIENCY

William A. Peabody, 7918 E. 18th Pl., Tucson, Ariz. 85710, and Ernest M. Schaaf, Tucson, Ariz., assignors to William A. Peabody, Tucson, Ariz.

Filed Jun. 7, 1978, Ser. No. 913,528
Int. Cl.[2] F25B 47/00; F28D 5/00
U.S. Cl. 62—85 17 Claims




1. Apparatus for increasing air conditioner efficiency by cooling the air conditioner compressor pump high temperature high pressure refrigerant gas outlet pipeline by water spray at the air conditioner condenser comprising means to treat water, said means including a fluid stabilizer rod in communication with the water to retain in the water particulate matter dissolved and suspended in the water; and means to bathe a portion of the compressor gas output pipeline with a spray of water so treated, said means including a nozzle and a shield to selectively direct the water to a portion of the pipeline, said nozzle located interiorly to said shield, and said shield attached to the air conditioner condenser adjacent said compressor gas output pipeline whereby the refrigerant gas is cooled by the spray of water and the particulate matter in the water does not precipitate out to form scale upon the compressor gas output pipeline or cooling fins of the air conditioner condenser.

12. A method for increasing air conditioner efficiency by cooling the air conditioner compressor pump high temperature high pressure refrigerant gas output pipeline with water at the air conditioner condenser comprising the steps of:

(a) treating water to retain in the water particulate matter dissolved and suspended therein,

(b) sensing the air conditioner compressor pump input refrigerant gas pressure, and

(c) sensing the compressor pump refrigerant gas output temperature, and

(d) controllably bathing the compressor pump refrigerant gas output pipeline with the treated water in accordance with compressor input gas pressure and output temperature so sensed whereby the water carries off the heat from the high temperature high pressure refrigerant gas output pipeline and the pipeline is not scaled by the particulate matter in the treated water.

---

## 4,213,307
## OIL SEPARATION AND RETURN SYSTEM FOR CENTRIFUGAL REFRIGERANT COMPRESSORS

Thomas E. Watson, Staunton, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

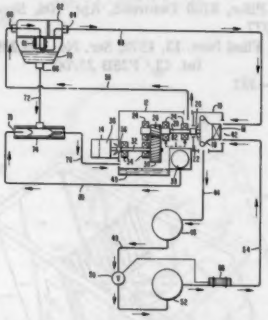
Filed Nov. 13, 1978, Ser. No. 960,362
Int. Cl.[2] F25B 31/00
U.S. Cl. 62—192 6 Claims

1. In combination with a high speed centrigugal refrigerant compressor including a motor housing, a separate gear and bearing housing containing an oil sump, and a separate compressor casing containing a high speed impeller driven by a shaft extending into said casing from said gear and bearing housing, a system for venting refrigerant gas from said gear and bearing housing to the suction space of said compressor and continuously returning oil entrained in said vented refrigerant gas to said gear and bearing housing, comprising:

a relatively small coalescing filter housing having an oil and gas inlet, a gas outlet, and an oil outlet;

a high efficiency coalescing filter medium in said housing with the upstream side of said medium being in communication with said inlet, and both said gas and oil outlets being in communication with the downstream side of said medium;

an oil and refrigerant gas line connecting the interior of said gear and bearing housing to said oil and gas inlet of said filter housing;



a refrigerant gas line connecting said gas outlet to said suction space to provide a source of suction for venting refrigerant and entrained oil from said gear and bearing housing; and

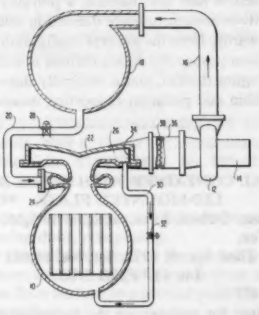
first oil pump means having an inlet connected to receive oil from said coalescing filter housing oil outlet and having an outlet connected to the interior of said gear and bearing housing to continuously return to said gear and bearing housing oil extracted from said coalescing filter medium while said compressor is operating.

---

## 4,213,308
## VORTEX GENERATOR FOR SEPARATING A GASEOUS AND LIQUID REFRIGERANT

J. Hilbert Anderson, 2422 S. Queen St., York, Pa. 17402

Filed Oct. 12, 1978, Ser. No. 950,570
Int. Cl.[2] F25B 41/00
U.S. Cl. 62—196 R 8 Claims



1. In a refrigeration system embodying a compressor, condenser and evaporator connected by suitable conduits in a closed circuit, a vortex generating means for separating a gaseous and liquid refrigerant and located downstream of said evaporator, said vortex means including a lower chamber and

upper chamber, said condenser connected to said lower chamber for delivering a stream of vapor and liquid thereto, said evaporator communicating with said lower chamber for delivering a stream of vapor thereto for mixing with the condenser stream of vapor and liquid, said mixture swirling outwardly into said upper chamber to separate the liquid from the vapor with said vapor flowing to said compressor with the vapor contained in the stream of vapor and liquid from said condenser by-passing said evaporator.

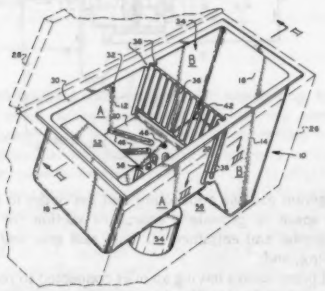
---

**4,213,309**

## RECREATIONAL VEHICLE MULTI-LEVEL COOLER

**William J. Pifer, 8100 Denwood, Apt. 106, Sterling Heights, Mich. 48077**

**Filed Nov. 13, 1978, Ser. No. 960,239**
**Int. Cl.² F25B *25/00***
**U.S. Cl. 62—332** **8 Claims**



1. A cooler particularly suitable for use with recreational vehicles comprising, in combination, a receptacle defined by first and second end walls, first and second side walls, a first bottom disposed adjacent said first end wall and a second bottom disposed adjacent said second end wall, said side walls each including a first portion intersecting said first end wall and said first bottom, a second portion intersecting said second end wall and said second bottom and a central region disposed intermediate said first and second bottoms, the vertical dimension of said first wall portions and said first end wall being less than the vertical dimension of said second wall portions and said second end wall whereby said first bottom is located at a higher vertical elevation than said second bottom, a drain opening defined in said first bottom, a plurality of block ice supporting ridges homogeneously defined in said first bottom extending upwardly from the general configuration of said first bottom, partition supporting means defined in said side walls at said central region thereof, and a vertically disposed partition supported within said partition supporting means.

---

**4,213,310**

## THERMAL CONTAINER WITH QUICK-RELEASE LID-MOUNTED FLASK

**Kenton A. Buss, Oxford, Kans., assignor to Igloo Corporation, Houston, Tex.**

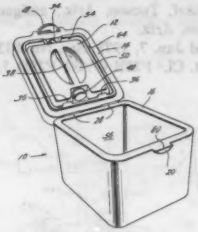
**Filed Apr. 3, 1979, Ser. No. 18,002**
**Int. Cl.² F25D *3/08***
**U.S. Cl. 62—457** **12 Claims**

1. A container for maintaining the temperature of the contents placed therein comprising

a body having a cavity for holding the contents,

a lid pivotally secured to the body for closing the cavity of the body, said lid having a top, and an underside,

a flask for holding a thermal material which is heated or cooled as desired to maintain a hot or cold temperature in the cavity, and



a single locking means mounted on the lid for simultaneously locking the lid and the body together and for releasably securing the flask in position on the underside of the lid.

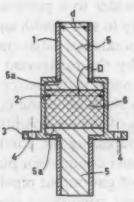
---

**4,213,311**

## SUPERLEAK

**Adrianus P. Severijns, and Frans A. Staas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 13, 1978, Ser. No. 960,370**
**Claims priority, application Netherlands, Dec. 16, 1977, 7713951**
**Int. Cl.² F25B *19/00***
**U.S. Cl. 62—514 R** **4 Claims**



1. A superleak which comprises a duct, a filler mass of low heat conductivity in said duct, said filler mass being capable of passing superfluid $^4He$, a housing formed in said duct at an intermediate location thereof, and an integral filler mass of higher heat conductivity in said housing, said integral filler mass effecting heat transfer in a direction transverse to the $^4He$ flow direction, said integral filler mass being a mixture of a low heat-conductivity filler material and a higher heat-conductivity filler material and having the same or substantially the same effective cross-sectional flow area as the filler mass in the duct.

---

**4,213,312**

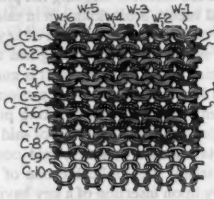
## PANTY HOSE WITH STRETCH-COTTON PANTY

**Sam C. Safrit, Pfafftown; Edward L. Cassidy, Sr.; William B. Cothran, both of Burlington, and Roscoe M. Farrell, Pittsboro, all of N.C., assignors to Alamance Industries, Inc., Burlington, N.C.**

**Filed May 1, 1978, Ser. No. 901,434**
**Int. Cl.² A41B *9/02, 9/04, 9/10***
**U.S. Cl. 66—177** **11 Claims**

1. A lightweight stretchable panty hose garment including a panty portion characterized by an outer face knit of thermoplastic textured main body yarn and having substantially stretchable, retractable, and smooth conforming fit characteristics in combination with an inner surface of nonstretchable staple cotton yarn, said cotton yarn being knitted in plated relationship with the main body yarn substantially throughout some courses so as to lie on the inner surface of the main body

yarn loops adjacent the skin of the wearer, the courses containing cotton yarn being noncontiguous and being spaced apart by at least two courses of said main body yarn, whereby the stretchable open lightweight characteristics of the main body yarn fabric are not restricted by the cotton yarn, and said




courses of cotton yarn plated with said main body yarn being spaced apart by no more than about three courses of said main body yarn so that the courses containing the cotton yarn are sufficiently close together to provide a soft, sanitary, nontoxic and moisture absorbing inner surface on said panty portion.

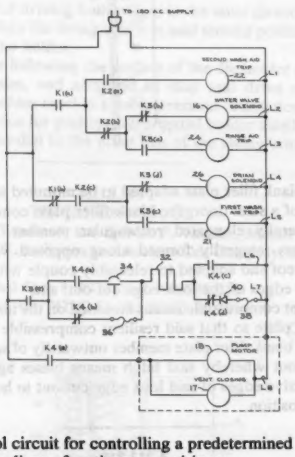
---

**4,213,313**

## RELAY CONTROL CIRCUIT FOR WASHING APPLIANCE

**George E. Kiefer, and LeRoy J. Herbst, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.**

**Filed Apr. 2, 1979, Ser. No. 26,104**
**Int. Cl.³ D06F *33/02***
**U.S. Cl. 68—12 R** **5 Claims**




1. A control circuit for controlling a predetermined number of washing appliance functions comprising:

a plurality of relays, said number of relays being less than said predetermined number of functions;

the contacts of said relays being interconnected to form a plurality of distinct relay combinations;

means for performing each of said functions;

each one of said performing means being placed in its operative state in response to the selection of a different one of said relay combinations; and

controller means for selecting each of said distinct relay combinations by selectively activating and inactivating different ones of said plurality of relays;

said plurality of distinct relay combinations including at least one transition relay combination which is automatically selected by said controller means in changing from at least one desired operative relay combination to a second desired operative relay combination, to prevent the initiation of unwanted functions resulting from the inadvertent selection of an incompatible relay combination in changing between said desired operative relay combinations, said transition combination being compatible with said second desired combination;

whereby performance of each of said functions is initiated by selection of the specific combination of activated and inactivated relays associated with that function.

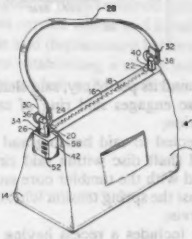
---

**4,213,314**

## HANDBAG LOCK

**David A. Trader, 11308 Dockside Cir., Reston, Va. 22091**

**Filed Dec. 27, 1978, Ser. No. 973,729**
**Int. Cl.² E05B *67/38***
**U.S. Cl. 70—68** **19 Claims**




1. A locking device for a receptacle having an elongated opening defining first and second ends for access into said receptacle and an elongated carry member, said locking device comprising:

means for closing said receptacle opening, said closing means including a longitudinally traveling fastening element for interengaging the opposing sides of said receptacle opening, said fastening element having a handle thereon for gripping said fastening element, said closing means being arranged so that said receptacle opening is closed when said fastening element is at said first end of said receptacle opening;

said handle having an opening therein;

said carry member having two ends, a first end having an engagement member thereon and second end permanently attached to said receptacle; and,

engaging and locking means connected to said receptacle adjacent said first end of said receptacle opening for engaging and locking said engagement member of said carry member, said engagement member and said handle being adapted so that said engagement member may be passed through said handle opening to hold said handle in position when said engaging and locking means engages and locks said engagement member.

---

**4,213,315**

## KEY ACTUATED SECURITY ENTRY SYSTEM

**Bernard R. Lewis, 2049 S. Ocean Dr., Hallandale, Fla. 33009**

**Filed Mar. 17, 1978, Ser. No. 887,472**
**Int. Cl.² E05B *65/00***
**U.S. Cl. 70—94** **1 Claim**

1. A security system to prevent unauthorized entry to an inwardly opening door, comprising:

a doorstop pivotally mounted to the inwardly opening side of said door, said doorstop moveable from a first position above the floor surface to a second position engaged with the floor surface;

a cable; and

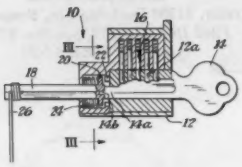
a key-actuated tumbler lock having a housing, a tumbler core, and a plurality of tumblers, said lock mounted through said door, said key-actuated tumbler lock having a shaft having a first position moveable and free of said

lock housing and a second position locked to the lock housing, said cable connected between said shaft and said doorstop whereby rotation of the shaft by a proper key effects lifting of the doorstop;

said tumbler core movable by insertion of the proper key with key bits for aligning the tumblers to effect rotation of the core;

said lock housing having a ring having a plurality of teeth disposed inwardly fixed to the housing;

said shaft including a disc having a plurality of rachet teeth




disposed around its periphery, said shaft being mounted so that said disc engages said ring of said housing in said second position;

a spring connected to said housing and said shaft disc for holding said shaft disc within said ring teeth, said shaft being aligned with the tumbler core and movable longitudinally against the spring tension whenever a proper key is inserted therein;

said shaft disc includes a recess having a shape to permit entry of a key tip to effect rotation of said shaft when the shaft is separated from the housing ring.

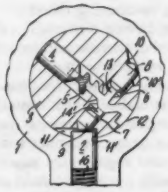
---

**4,213,316**

## CYLINDER-LOCK MECHANISM AND KEY MEANS THEREFORE

**Werner Tietz, Britzer Damm 196, 1000 Berlin 47, Fed. Rep. of Germany**

**Filed Aug. 10, 1978, Ser. No. 932,500**
**Int. Cl.[2] E05B *27/06***
**U.S. Cl. 70—35 B** **11 Claims**



1. A cylinder lock, comprising a casing having a primary bore, a cylinder rotatable in the bore and having a longitudinally extending insertion slot for reception and longitudinal guidance of an inserted substantially flat key, coacting pin-tumbler means carried by said casing and cylinder and establishing a predetermined rotationally locked angular relation of said cylinder and casing in the absence of insertion of a key having a correct pin-tumbler actuating profile, said pin-tumbler means comprising a longitudinally distributed plurality of case pins and core pins and pin-guide bores in said casing and cylinder and aligned with each other when in said locked angular relation, spring means carried by said casing and normally urging said core pins via their associated said case pins to a radially inner position in which said case pins simultaneously engage both of the associated aligned pin bores to thereby retain the locked angular relation in the absence of such key insertion as will elevate the locus of all pin-to-pin abutments to a rotary-release position at the effective radius of said cylinder, said cylinder having a transversely extending blocking-pin bore substantially normal to the general plane of the path of the flat of the key-insertion passage via the slotted opening, said blocking-pin bore having at its outer end an enlarged generally radially shouldered recess of size and radial-plane alignment as to accommodate limited radially inward entry of one of said case pins in the event that said recess is unoccupied upon cylinder rotation to the extent of aligning the pin-guide bore of the casing with said recess, a blocking pin in said blocking-pin bore and therefore on one side of the path of key insertion, the effective length of said blocking pin being less than the effective length of blocking-pin bore in which it is guided, whereby upon insertion of a key having a side-rib projecting profile to engage and sufficiently elevate said blocking pins to substantially the geometrical cylindrical surface of said cylinder, and upon thereafter rotating said cylinder, said core pin will be prevented from entering the applicable one of said recesses, and further whereby upon insertion of a key having effectively less than said side-rib projecting profile, said core pin will be resiliently urged to dog said cylinder against continued rotation in said casing.

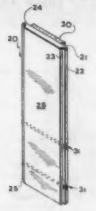
---

**4,213,317**

## BLANK FILLER PLATE FOR LOCK EDGE CUT-OUT

**Robert O. Ruff, Cincinnati, Ohio, assignor to American Standard Inc., New York, N.Y.**

**Filed Feb. 21, 1979, Ser. No. 13,348**
**Int. Cl.[2] E05B *9/08, 63/00***
**U.S. Cl. 70—450** **8 Claims**




1. A blank filler plate adapted to be mounted in a lock edge cut-out of a steel door, the blank filler plate comprising:

a generally elongated rectangular member having latch means integrally formed along opposed vertical edges thereof and adapted to releasably couple with the respective edges of the lock edge cut-out; and

resilient compressible means mounted on the inner surface of said plate so that said resilient compressible means urges said blank filler plate member outwardly of said lock edge cut-out whereby said latch means biases against the respective edges of said lock edge cut-out to hold said plate in position.

---

**4,213,318**

## APPARATUS FOR FITTING AN EXTRUSION DIE HOLDER ONTO THE PRESS STEM OF AN INDIRECT METAL EXTRUSION PRESS

**Fritz Priebe, Duisburg, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed Dec. 26, 1978, Ser. No. 973,535**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757964**
**Int. Cl.[2] B21C *25/02, 33/00***
**U.S. Cl. 72—21** **10 Claims**

1. Apparatus for fitting an extrusion die holder onto the press stem of an indirect extrusion press, the apparatus comprising:

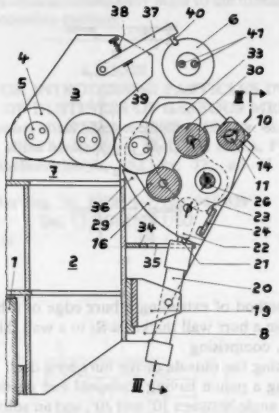
a stationary frame;

a swing arm mounted on the frame and having an upper edge;

two cylindrical rollers mounted for rotation at the upper edge of the swing arm;

feed means for feeding die holders to the upper edge of the swing arm;

means for pivoting the swing arm about an axis between a first position where the feed means feeds a die holder onto the arm so that the holder is supported on said upper edge and on one of the two rollers, and a second position where the die holder is supported on both rollers;




drive means for driving both rollers in the same direction of rotation, when the swing arm is in said second position, to rotate the die holder;

sensing means following the surface of the die holder as the holder rotates, and arranged to stop said drive means when the holder reaches a predetermined orientation; and

a push-on device for pushing the oriented holder axially in a direction parallel to the pivot axis of the swing arm.

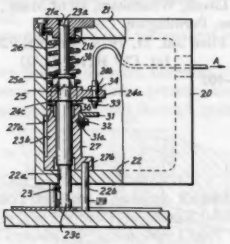
---

**4,213,319**

## THICKNESS GAUGE

**Vance B. Gold, Lombard, and Robert P. Vandlik, Mount Prospect, both of Ill., assignors to American Can Company, Greenwich, Conn.**

**Filed Oct. 5, 1978, Ser. No. 948,714**
**Int. Cl.² B21C *51/00*; B21D *28/00***
**U.S. Cl. 72—34** **12 Claims**




1. A housed instrument to be carried on a press ram for movement therewith to and from the working plane of the press for measuring the stock skeleton thickness in the press comprising:

(a) a housing affixed to the press ram and having a hollow inside to enclose said instrument;

(b) a first means resiliently mounted within said housing for movement relative to the direction of travel of the press ram and being housed in alignment with and normal to the working plane of the press for engaging the stock skeleton lying thereon and flattening the stock skeleton against press bed to remove residual strain;

(c) a second means resiliently associated with said housing and carried from the direction of press ram movement in sliding engagement with said first means for alignment with the normal to the working plane of the press for engagement therewith whereby stock skeleton thickness thereby displaces said first means relative to said second means in response to said cut material lying over the press working plane and lying under said first means;

(d) an inter-engaging means being facing portions of said first and second means adapted to move said first means with said second means as a unit relative to said housing when said second means is moved opposite the direction of ram travel beyond a predetermined distance; and

(e) measuring means carried within said housing and responsive to changes in said displacement between said first and second means for establishing a signal indicative of said relative displacement being the stock skeleton thickness.

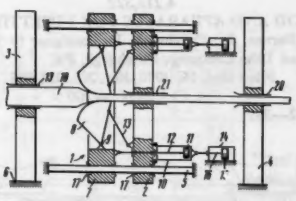
---

**4,213,320**

## ROLL-FORGING MILL

**Vladimir N. Vydrin, ulitsa Timiryazeva, 28, kv. 27; Evgeny N. Berezin, ulitsa Engelsa, 28, kv. 72, and Vladimir G. Dremin, ulitsa Beloretskaya, 70, kv. 22, all of Chelyabinsk, U.S.S.R.**

**Filed Nov. 1, 1978, Ser. No. 956,619**
**Claims priority, application U.S.S.R., Nov. 1, 1977, 2531851**
**Int. Cl.² B21B *13/18***
**U.S. Cl. 72—189** **5 Claims**

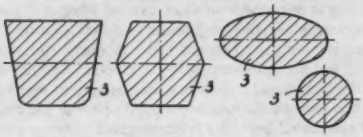



1. A roll-forging mill for working metal along a passline comprising: a frame; a roll stand mounted on said frame for reciprocation along a passline; an actuator for controlling movement of said roll stand; working tools mounted on said roll stand for rocking motion to thereby perform reduction of a metal being worked; stationary guides disposed in parallel to the passline; a support stand mounted on said guides for movement along the passline; a plurality of bars, each bar having one end pivotally connected to said support stand and the other end eccentrically pivoted to one of said working tools for imparting rocking motion to said working tools; power cylinder means secured on said frame and connected with said support stand for coordinating the travelling speed of the roll stand with the speed of the metal being worked during reduction; said roll stand actuator being mounted on said support stand and connected with the roll stand for reciprocating said roll stand thereby transmitting rocking motion to said working tools.

## 4,213,321
## ROLLING METHOD AND ROLLING MILL FOR AN INGOT ORIGINATING FROM A CONTINUOUS CASTING MACHINE OF THE WHEEL-AND-BELT TYPE

Giulio Properzi, via Pietro Cossa, 1 Milano, Italy

Filed Jan. 25, 1978, Ser. No. 872,216
Claims priority, application Italy, Mar. 31, 1977, 21928 A/77
Int. Cl.² B21B 1/00
U.S. Cl. 72—235 8 Claims

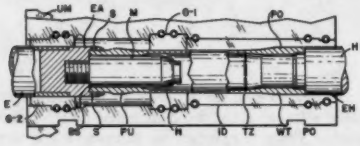



1. A rolling method for an ingot originating from a continuous casting machine of the wheel-and-belt type, and having a substantially trapezoidal cross-section, wherein before being rolled by rolling stands comprising two rolls alternately arranged at 90° to each other, the ingot of substantially trapezoidal cross-section is first rolled simultaneously on the side corresponding to the minor base of the substantially trapezoidal cross-section and on the edges of the major base of the substantially trapezoidal cross-section by three rolls having flat profiles arranged to form a rough-rolled product with a cross-section having two orthogonal axes of symmetry.

## 4,213,322
## METHOD AND APPARATUS FOR UPSETTING PIPE

Floyd A. Barnes, Jr., Pittsburgh, Pa., assignor to Youngstown Sheet and Tube Company, Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 951,988
Int. Cl.² B21D 41/00
U.S. Cl. 72—357 12 Claims




1. A method of upsetting one end of a pipe having an enlarged opposite end, which method comprises:

placing said pipe in an upset die cavity having an upset header entrance end, said cavity having an axial extent longer than said pipe with said enlarged end being within an enlarged cavity portion;

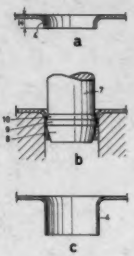
gripping the circumference of said pipe by means positioned within said die and between said enlarged cavity portion and said upset header entrance end; and

inserting an upset header and moving it axially inwardly of said die to axially displace part of the terminal portion of said pipe and through the cojoint action of the upset header and said die enlarging the wall thickness of said pipe at said one end.

## 4,213,323
## METHOD AND APPARATUS FOR EXTRUDING A BURRED EDGE OF A HOLE IN A METAL SHEET

Johannes A. G. De Deugd, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,644
Claims priority, application Netherlands, Dec. 20, 1976, 7614120
Int. Cl.² B21D 22/00
U.S. Cl. 72—358 6 Claims




1. A method of extruding a burr edge of a hole in a metal sheet, from a burr wall thickness $S_k$ to a wall thickness $S_r$ after extrusion, comprising

supporting the outside of the burr by a die,

selecting a punch having a conical end portion with a half apex angle between 10° and 20°, and an adjoining cylindrical portion having a diameter greater than the inside diameter of the burr and a cylindrical portion length approximately equal to the value l satisfying the relationship

$$1 \geqq \frac{S_r\sqrt{3}}{m} - 2\ln\frac{S_k}{S_r}$$

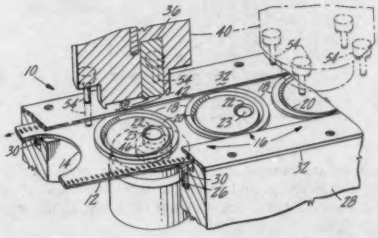
where m is the coefficient of friction between said portions and the burr wall,

and then extruding the burr by passing, the punch through the die supported burr.

## 4,213,324
## PUNCH PRESS AND METHOD FOR MAKING CAN ENDS WITH CLOSURES

John S. Kelley, Wenham; Frederick G. J. Grise, Osterville, and Walter C. Lovell, Wilbraham, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jul. 21, 1978, Ser. No. 926,881
Int. Cl.² B21D 43/05
U.S. Cl. 72—405 10 Claims




1. In a punch press having a carrier means for holding and sequentially moving sheet metal workpieces with limited lat-

eral and heightwise play to and through at least two stations, each of the stations including at least one pair of upper and lower axially cooperative forming dies, the improvement comprising: at least an initial one of the pairs of the series of dies adapted to form a registerable feature in each workpiece, and mechanism for relieving holding pressure between the carrier means and the workpieces when at a station subsequent to the initial one and during an initial phase of die closure whereby a die of each pair following said initial one is enabled to register with said feature as the workpiece is thereby allowed self-positioning accommodation immediately prior to die forming operations at the successive stations.

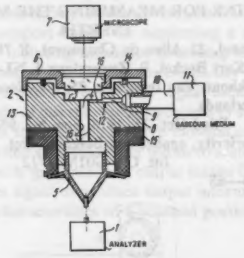
---

**4,213,325**

## DEVICE FOR INTRODUCING PARTICLES INTO ANALYZER OF DUSTINESS OF GASEOUS MEDIUM

**Evgeny S. Tumanov, ulitsa Shelkovichnaya, 184, kv. 48; Nikolai V. Zhamkov, ulitsa Mokhovaya, 33/1, and Lev A. Kudryavtsev, ulitsa Shelkovichnaya, 182, kv. 72,, all of Saratov, U.S.S.R.**

**Filed Sep. 26, 1978, Ser. No. 946,029**
**Int. Cl.² G01N *15/00***
**U.S. Cl. 73—1 G** **3 Claims**




1. A device for introducing a determinable quantity of particles into an analyzer of dustiness of a gaseous medium, the particles being used to calibrate the analyzer, said device comprising:

a cell having a wall, a bottom and a transparent cover;

a through guide duct made in said wall of said cell;

a vertical feed duct made in said bottom of said cell, intended for communication with the analyzer and having an inner surface;

a horizontal channel made in said bottom of said cell, which is an extension of said through guide duct, intersects said vertical feed duct, and has an inner surface, said horizontal channel receiving particles to be sensed by an analyzer being calibrated;

a microscope arranged above said transparent cover of said cell; and

a source of a pure gaseous medium, intended for supplying said pure gaseous medium under pressure and having an outlet communicating with said through guide duct.

---

**4,213,326**

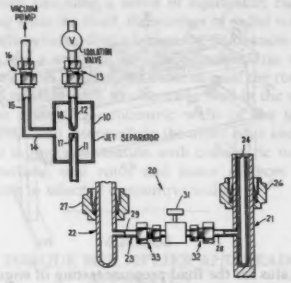
## SAMPLE SUPPLY DEVICE

**Thomas F. Brodasky, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Filed Feb. 14, 1979, Ser. No. 12,067**
**Int. Cl.² G01N *31/08***
**U.S. Cl. 73—23.1** **13 Claims**

1. A sample introduction device for introducing a vaporized sample to the ion source of a mass spectrometer, with there being an isolation valve for controlling flow of vaporized sample to said ion source and a vacuum source separate from said mass spectrometer for removing air from the sample, said sample introduction device comprising:

a sample holding tube for holding a sample in a non-gaseous state, said sample holding tube having on the exterior thereof a fitting member adapted to be releasably sealingly secured to a cooperating fitting member of said isolation valve so that the sample contained in said sample holding tube can be vaporized therein and transported through said isolation valve to said ion source of said mass spectrometer; and




conduit means releasably sealingly connectable to said vacuum source and connected to said sample holding tube whereby air can be evacuated from said sample holding tube, and a vacuum control valve in said conduit means for opening and closing communication between said vacuum source and said sample holding tube.

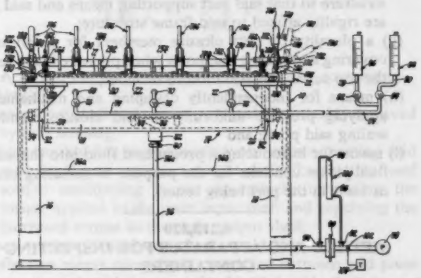
---

**4,213,327**

## FLOW BENCH

**John F. Prescott, Jr., Danville, and William H. Roberts, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 11, 1979, Ser. No. 2,754**
**Int. Cl.² G01M *3/02***
**U.S. Cl. 73—38** **2 Claims**



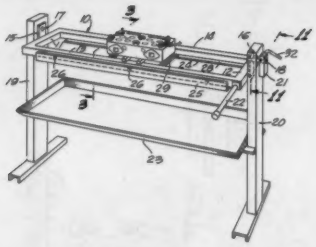
1. An air flow test apparatus for determining the rate of air flow across a porous laminated metal panel of controlled porosity established by pores of controlled size extending through the lamina and distributed over the area of the lamina comprising: a top, a sealed box secured to said top, said box having an internal cavity and an upward facing opening therein, means for locating said panel in said top, seal means fixedly securing the panel to the top to cover the opening while simultaneously sealing the top, bottom and edge of the panel, means for supplying air pressure at spaced points therein into said box for producing a controlled uniform pressure differential across the sheet throughout its planar extent, and means for preventing the porous panel buckling upon application of air pressure to the box.

**4,213,328**

## APPARATUS FOR FLUID PRESSURE TESTING OF ENGINE CYLINDER HEADS AND SIMILAR PARTS

**Ronald C. Roeschlaub, Los Angeles, and Albert Fegel, Whittier, both of Calif., assignors to Irontite Products, Inc., El Monte, Calif.**

**Filed Feb. 27, 1979, Ser. No. 15,850**
**Int. Cl.[2] G01M *15/00***
**U.S. Cl. 73—49.7** **6 Claims**



1. Apparatus for the fluid pressure testing of engine cylinder heads and similar parts having a fluid circulating jacket containing communicating ports which open into a mating connecting surface comprising:

(a) a frame structure possessing a pair of end rails connected to a pair of side rails so as to form a rigid rectangular framework;

(b) means for supporting said frame structure;

(c) means pivotally connecting said frame structure to said frame support means so that said frame structure is free to pivot about an axis longitudinal of said frame structure;

(d) means for locking said pivoting connecting means of said frame structure in one or more fixed positions to prevent pivoting of said frame structure;

(e) means for supporting the part to be tested on said frame structure with said part's mating surface exposed and substantially above the plane of said frame structure, said part supporting means extending across and immediately above said side rails;

(f) means for securing the part to be tested to said frame structure so that said part supporting means and said part are rigidily affixed to said frame structure;

(g) a plurality of port closure members for individually covering and sealing said ports when pressure is applied to the top surface of said closure member;

(h) means for independently clamping and mechanically applying pressure uniformly to said closure members, sealing said ports; and

(i) means for introducing a pressurized fluid into the sealed fluid-jacket conduits for the purpose of detecting cracks or leaks in the part being tested.

---

**4,213,329**

## METHOD AND APPARATUS FOR INSPECTING CONTAINERS

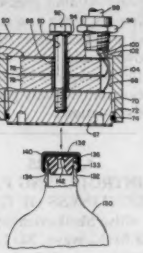
**Samuel O. Raymond, North Falmouth, and Gary G. Hayward, Falmouth, both of Mass., assignors to Benthos, Inc., N. Falmouth, Mass.**

**Filed Jan. 23, 1979, Ser. No. 5,799**
**Int. Cl.[2] G01M *3/00***
**U.S. Cl. 73—52** **28 Claims**

1. Method of inspecting vacuum packed containers to determine the level of vacuum therein comprising:

subjecting a vacuum packed container of a liquid or semi-liquid to a sharp force applied so that successively (1) at least one cavity is formed in the liquid or semi-liquid as a result of relative vertical displacement of said container and contents in a first direction and (2) the cavity is eliminated and an audible sound is produced as a result of relative vertical displacement of said container and contents in a second opposite direction;

providing a first signal representative of the interval between the time at which said container is subjected to said force and the time at which said sound is detected; and



generating in response to said first signal a second signal indicative of whether the level of vacuum in said container is less than or exceeds a predetermined value.

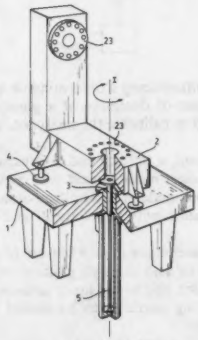
---

**4,213,330**

## MACHINE FOR MEASURING THE MOMENTS OF INERTIA

**Rudolf Brozel, 22 Allee de Chaponval, F 78590 Noisy-le-Roi, France; Kurt Beckel, B. Zweerslaan 4, NL-Voorscmoten, and Jan Berkhout, Van Iersellaan 25, NL-Noordwykerhout, both of Netherlands**

**Filed Oct. 23, 1978, Ser. No. 953,846**
**Claims priority, application Belgium, Oct. 28, 1977, 0182183**
**Int. Cl.[2] G01M *1/12***
**U.S. Cl. 73—65** **3 Claims**



1. A machine for measuring the difference between two moments of inertia of an engine or unit about two ortogonal axes, the said machine comprising: a fixed horizontal plate having a central opening, an oscillating table mounted with a vertical rotary shaft coupled with a torsion bar so as to be capable of oscillation about the longitudinal axis of said rotary shaft,

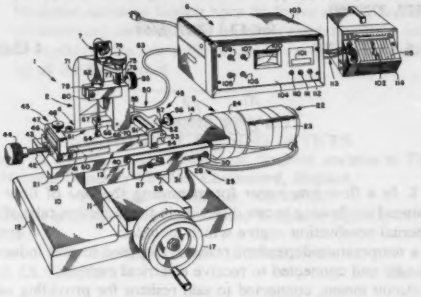
said oscillating table comprising a horizontal part having first fastening means for securing the engine or unit and a vertical part rigidly fixed to the horizontal part, said vertical part having second fastening means for the engine or unit,

said oscillating table being supported on the fixed plate by means of a plurality of pneumatic support devices spaced from an arranged symmetrically around the rotary shaft, with the said rotary shaft extending through the fixed plate and being centered in the central opening in said fixed plate by radial bearing means.

## 4,213,331
## SURFACE IRREGULARITY ANALYZER

John P. Porter, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 20, 1978, Ser. No. 971,577
Int. Cl.[3] G01B 5/28
U.S. Cl. 73—105 46 Claims



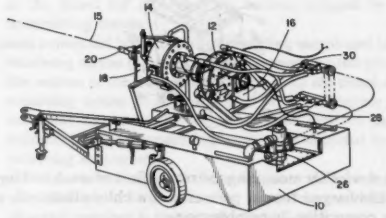
1. Apparatus for measuring surface characteristics of a specimen, comprising: support means for supporting a specimen, said support means including means for stretching such specimen; transducer means for directly mechanically engaging such specimen to produce a transducer signal indicating the surface characteristic of discrete surface portions of such specimen; motion means for effecting relative movement between said support means and said transducer means to scan the latter on the surface of such specimen; and output means for analyzing such transducer signal to produce output information representing surface characteristics of a scanned portion of such specimen.

---

## 4,213,332
## ROTOR-STATOR CONFIGURATION FOR WATER BRAKE DYNAMOMETER

Melvin E. Bonomo, Bloomington; Kenneth M. Coldren, Colfax; Verne O. Lemke, Gibson City; Loren L. Rathbun, Colfax, all of Ill., and Ronald D. Towner, Tucson, Ariz., assignors to M & W Gear Company, Gibson City, Ill.

Filed Jan. 15, 1979, Ser. No. 3,587
Int. Cl.[2] G01L 5/00
U.S. Cl. 73—134 8 Claims



1. In a water brake dynamometer of the type including a stator housing having a longitudinal axis;

pivot mounting means for mounting the stator housing on the axis;

a rotor mounted on a shaft in the stator housing;

means for circulating fluid through the stator housing including means for supplying a constant volume of fluid at constant pressure to the housing; and

means for sensing torque imparted from the rotor to the stator housing, the improvement of an improved fluid momentum transfer configuration for the rotor and stator housing comprising,

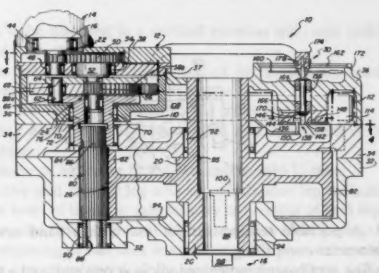
a rotor disc having an axis of rotation coincident with the stator housing axis, said disc having planar, spaced, disc surfaces transverse to the axis, said stator including opposed surfaces parallel to and spaced from the rotor surfaces, each of said rotor surfaces and each of said stator housing surfaces having an identical surface pattern of depressions including a series of equispaced radial walls extending from the shaft, the number of radial walls on the rotor surface being distinct from the number on the stator surface; and a series of equispaced concentric walls, one concentric wall being at the outer edge of the rotor disc in opposed relation with a concentric wall in the stator surface, the remaining concentric walls of the stator disc being positioned intermediate the outer edge and the shaft and also in opposed relation with concentric walls in the stator surface; said rotor and stator surfaces including radial cuts in selected concentric walls.

---

## 4,213,333
## HIGH TORQUE MULTIPLIER AND READOUT APPARATUS

Raymond L. Krieger, Denver; Ralph W. Weaver, Aurora, and Edward T. Able, Denver, all of Colo., assignors to B. K. Sweeney Manufacturing Co., Denver, Colo.

Filed Oct. 31, 1978, Ser. No. 956,402
Int. Cl.[3] G01L 3/02
U.S. Cl. 73—136 R 20 Claims



1. A torque multiplier and readout apparatus, comprising:

a housing;

a main input shaft and a main output shaft rotatably received by said housing;

torque multiplying means operatively interconnecting said main input and said main output shafts for rotation, said torque multiplying means operatively increasing the torque applied to the main input shaft and supplying the increased torque to the main output shaft;

pivot means pivotably attached to said housing;

deflection means operatively connected between said pivot means and said housing for biasing said pivot means toward an initial position, said deflection means applying biasing force to said pivot means in predetermined magnitude related to the amount of pivoting of the pivot means away from the initial position, said deflection means comprising a plurality of elongated beam members, each beam member having deflection characteristics, each beam member being operatively connected at one end to said pivot means and operatively connected at the other end to said housing, at least two of said beam members being operatively connected at different positions to said pivot means;

reaction coupling means operatively connecting said pivot means with said torque multiplying means, said reaction coupling means coupling to said pivot means reaction torque resulting from torque multiplication by said torque multiplying means, the magnitude of reaction torque cou-

pled to said pivot means bearing a predetermined relation to the increased torque applied to the output shaft;

a torque meter apparatus attached to said housing, said torque meter apparatus including a meter input member for operating said meter apparatus to indicate torque; and

means operatively connecting said pivot means and said meter input member for operatively transforming movement from said pivot means to activate the meter input member of said torque meter assembly to indicate torque applied by said output shaft.

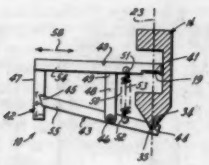
---

**4,213,334**

## TENSIOMETER

**Mark W. Wikoff, Cincinnati, Ohio, assignor to Best & Donovan, Cincinnati, Ohio**

**Filed Jan. 2, 1979, Ser. No. 159**
**Int. Cl.³ G01L 5/06**
**U.S. Cl. 73—144** **10 Claims**



1. A portable tensiometer for use with a band saw, said tensiometer comprising

a first arm having indicator indicia at one end, and a second arm having a pointer at one end, said first and second arms being pivotally connected together intermediate the ends thereof so that said pointer cooperates with said indicator indicia,

first joinder means for connecting the other end of said first arm with said saw's blade, said first joinder means preventing relative motion between said arm and said blade in a direction normal to the travel path of said blade when said tensiometer is in operational relation with said band saw,

second joinder means for connecting the other end of said second arm with said saw's housing, said second joinder means preventing relative motion between said second arm and said housing in a direction normal to the travel path of said blade when said tensiometer is in operational relation with said band saw, and

a spring connecting said two arms together one with another so that the first and second joinder means of said two arms are continuously spring loaded toward one another when assembled in operational relation with said band saw, said spring functioning to releasably connect said tensiometer with said saw's housing and said blade for connecting said blade and said tensiometer in operational relation, and functioning to deflect said blade toward that portion of said housing to which connection is effected for determining the tension in said blade through use of said indicator indicia and said pointer.

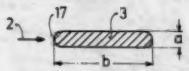
---

**4,213,335**

## FLOW RATE METER WITH TEMPERATURE DEPENDENT RESISTOR

**Cornelius Peter, Stuttgart, and Bernd Kraus, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 6, 1978, Ser. No. 913,138**
**Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2728060**
**Int. Cl.³ G01F 1/68**
**U.S. Cl. 73—204** **4 Claims**



1. In a flow rate meter for measuring the rate of flow of induced air flowing in one direction in the induction tube of an internal combustion engine which includes:

a temperature-dependent resistor, disposed in said induced air and connected to receive electrical current;

circuit means, connected to said resistor for providing said electrical current thereto and for measuring the resistance thereof, the improvement comprising:

said temperature-dependent resistor being configured in the form of a flat strip extending in a direction substantially transverse to said one flow direction of said induced air whereby said electrical current flows through said resistor in said substantially transverse direction, said strip having a cross-sectional shape to provide an arcuate leading surface which extends substantially transverse to said one flow direction and wherein the height of said arcuate leading surface is substantially smaller than the width of said strip extending substantially in said one flow direction.

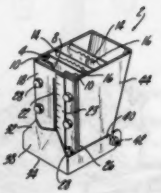
---

**4,213,336**

## DEVICE FOR MEASURING FLOW OF WEAK CELL LIQUOR

**Albert J. Schweickart, Southgate, and Thomas F. Mooney, III, Dearborn, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

**Filed Dec. 27, 1976, Ser. No. 754,289**
**Int. Cl.² G01F 1/20**
**U.S. Cl. 73—215** **4 Claims**



1. A device for measuring the rate of flow of weak cell liquor being discharged from a perk arm of a chlor-alkali cell, said device comprising, in combination,

an open-topped box means having side walls, a back-wall and a front portion,

a plate means having therein an orifice and a vertically extending slot above said orifice, said plate means having thereon and extending alongside said slot indicia adapted to identify the locations along the length of said slot, the dimensions of said orifice and said slot being such as to permit flows in the range of 3 to 7 liters per minute to be read with a sensitivity corresponding to changes of 4 to 10 milliliters per change of one liter per minute in the flow rate being metered,

means sealingly securing said plate means to said front portion of said box means, and

deflector means operatively associated with said box means to deflect liquid issuing from said orifice,

wherein said box means further has means for mounting said box to a discharge end of a perk arm of a chlor-alkali cell, wherein said means for mounting said box means comprises a spaced pair of band-like members, each of said band-like members having upon its lower side a plurality of serrations, said band-like members extending from one to another of the side walls of said box means in the vicinity of the top thereof.

---

**4,213,337**

## LIQUID LEVEL SENSING DEVICES

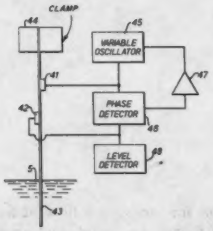
**Roger M. Langdon, Sible Hedingham, England, assignor to The Marconi Company Limited, Chelmsford, England**

**Filed Sep. 6, 1978, Ser. No. 939,987**

**Claims priority, application United Kingdom, Sep. 13, 1977, 38016/77**

**Int. Cl.² G01F *23/28*; G01S *3/80***

**U.S. Cl. 73—290 V** **2 Claims**




1. A liquid-level sensing device comprising, in combination:

an elongate member adapted to be partially submerged in a liquid, with one end out of said liquid;

transmitting means in contact with a portion of said member which is out of said liquid for inducing sinusoidal motion along said member in opposite directions from said portion;

means mounted on said member for absorbing said motion travelling from said portion toward said one end of the member;

flexure wave receiving means in contact with said member in spaced relation to said portion thereof beyond the level of the liquid for receiving the motion induced by said transmitting means;

means connected both to said transmitting means and to said receiving means for detecting and comparing the phase of the motion at the transmitting means with the phase at the receiving means so as to obtain a phase difference measurement representative of the transit time of motion induced by said transmitting means and detected by said receiving means; and

means for converting said obtained phase difference measurement into a form indicating the extent to which said elongate member is immersed in said liquid.

---

**4,213,338**

## LIQUID LEVEL INDICATOR

**Albert L. Hardy, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**

**Filed Feb. 21, 1979, Ser. No. 13,335**

**Int. Cl.² G01F *23/16***

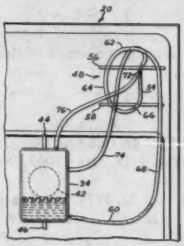
**U.S. Cl. 73—299** **9 Claims**

1. A liquid level indicator for a tank, said tank being movably mounted to be alternately positioned in a first or second position, said second position vertically tilted from said first position, said indicator arrangement comprising:

an air column fluid passage in fluid communication with the lower region of the interior of said tank, with said tank in said first position, said air column fluid passage including a first portion extending generally horizontally away from said tank, and the portion thereof immediately adjacent said tank elevated with respect to said tank with said tank in said second position;

said air column fluid passage including a second portion extending upwardly from said tank and said first portion of said air column fluid passage with said tank in said first position;

a vertically reversely curved fluid passage section in fluid communication with said air column at a location remote from said tank with said reversely curved sections forming




a U-tube disposed in a vertical position with said tank in said first position;

means for venting the upper end of the U-tube leg remote from said air column fluid passage;

means for venting said tank to the atmosphere;

viewing gage means associated with said remote leg of said U-tube;

a volume of indicator liquid retained in said U-tube;

whereby said remote leg acts as an indicator leg indicating the level of liquid in said tank by movement of said liquid into said first portion of said air column fluid passage by positioning of said tank in said first position, and the resulting compression of air in said air column fluid passage indicating liquid in said U-tube enabling liquid level indication by the position of indicating liquid in said indicator leg and in viewing of said liquid level by the aid of said viewing gage means.

---

**4,213,339**

## RESERVOIR SENSOR

**Joseph W. Shannon, Kent, Ohio, assignor to McNeil Corporation, Akron, Ohio**

**Filed Feb. 6, 1978, Ser. No. 875,201**

**Int. Cl.² B67D *5/08*; G01F *23/24*; G06F *15/46***

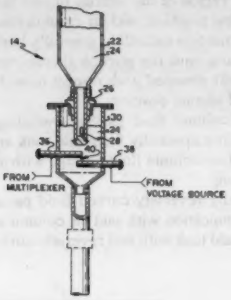
**U.S. Cl. 73—304 R** **10 Claims**

1. The improvement, in apparatus for sensing the presence of a particular level of fluid within each of a plurality of reservoirs, each of the reservoirs having an inlet and an outlet, comprising:

a pair of electrical contacts maintained within each of the reservoirs at the particular level and in adjustable diametrically opposed spaced relationship to each other for passing signals through the fluid, said spaced relationship determining the resistance of an electrical path between each said pair of electrical contacts at the particular level;

first means connected to said electrical contacts selectively applying electrical signals thereto for enabling the passing of said signals through the fluid of certain of the reservoirs, and

sensing means connected to said electrical contacts for sensing the passing of said signals and thereupon producing an




output indicating the presence of the fluid between said pair of contacts.

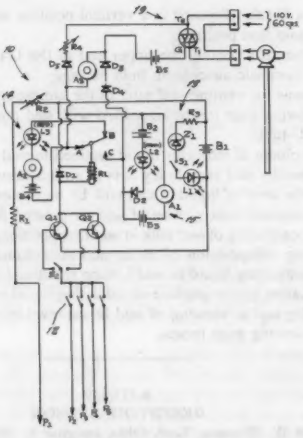
---

**4,213,340**

**OIL-WATER INTERFACIAL DETECTOR**

**Sheng-Hsiung Cheng, P.O. Box 17092, West Hartford, Conn. 06117**

**Filed Nov. 13, 1978, Ser. No. 960,306**
**Int. Cl.³ G01F *23/24***
**U.S. Cl. 73—304 R** **3 Claims**



1. An oil-water interfacial detector, comprising in combination, an instrument including a dip stick attached thereto; said instrument including therein an electrical circuit that has a first portion of said circuit for detecting a water presence below an interface, and a second circuit portion for detecting an oil presence above said interface; said electrical circuit additionally including an attached portion for connection to a pump for pumping out either said water or said oil; said dip stick including a first probe at its lowermost end connected by a first conductor to said circuit, and a plurality of probes vertically spaced apart from each other and said first probe, all said probes protruding from a same side of said dip stick, said plurality of probes each being selectively connected by an individual switch to a second conductor and to said circuit; said circuit including a relay having a contact arm that shifts between a first contact point and a second contact point, said first contact point being in said first circuit portion which includes a green lamp, an alarm and a power source, and said second contact point being in a second said circuit portion which includes a red lamp, an alarm and a power source, said first circuit portion being closed by presence of water between two said probes, and said second circuit portion being closed by presence of electrically non-conductive liquid such as oil between two said probes.

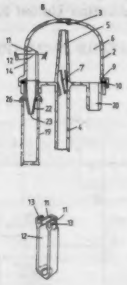
---

**4,213,341**

**APPARATUS FOR SAMPLING A FLOW OF LIQUID FROM A FLUID AT LEAST SOME OF WHICH IS A LIQUID**

**Douglas L. Wenham, Hamilton, New Zealand, assignor to AHI Operations Limited, Auckland, New Zealand**

**Filed Dec. 5, 1978, Ser. No. 966,731**
**Claims priority, application New Zealand, Dec. 9, 1977, 185923; Dec. 9, 1977, 185924; Dec. 9, 1977, 185925**
**Int. Cl.² G01N *1/14***
**U.S. Cl. 73—421 A** **7 Claims**



1. Apparatus for sampling a flow of liquid from a fluid at least some of which is a liquid, said apparatus comprising a body, an inlet conduit in said body terminating in an inlet orifice, said conduit being arranged in use so that said conduit is substantially vertical and said orifice is above said conduit, a curved dome mounted in use above said orifice and arranged relative thereto so that liquid in fluid passed up said conduit and through said orifice is substantially evenly distributed over the inner surface of said dome at least one set of flow dividing means arranged relative to said flow distributing surface, each said flow dividing means comprising at least four vanes on said distributing surface arranged so that the rate of flow of liquid in the space between a pair of intermediate vanes of said at least four vanes is not substantially different from the rate of flow over an equivalent space elsewhere in said substantially evenly distributed flow and for each said flow dividing means an outlet port in said body arranged to collect liquid from the area between two intermediate vanes in said flow dividing means, collecting means connected to said outlet port and further delivery means in said body arranged to collect and deliver from said body and dome the remainder of the fluid passing through said apparatus.

---

**4,213,342**

**LIQUID SAMPLER DEVICE**

**Wendall C. Gates, Box 2216, Santa Cruz, Calif. 95063**

**Filed Dec. 11, 1978, Ser. No. 968,513**
**Int. Cl.² G01N *1/14***
**U.S. Cl. 73—421 B** **18 Claims**

1. A device for taking liquid samples from a storage tank or other liquid containment while minimizing the exposure of the sample taker to the liquid or vapor therefrom, said device comprising:

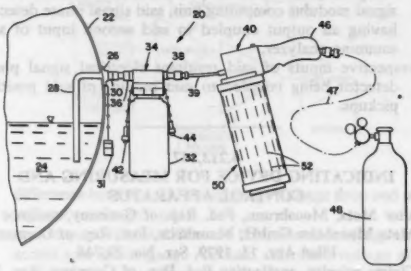
A. a sample container with an opening at one end;

B. head means on said container covering said opening and having inlet means and outlet means for said container, said inlet means being adapted to be connected to an outlet

from a vessel or conduit from which a sample is to be taken;

C. movable float means within said container and operative in response to the filling of said container for forcing out vapor through said outlet means and closing said outlet means when said container is substantially full of liquid;

D. filter means connected to said container outlet for trapping the vapor forced from said container as it is filled with liquid;



E. and control means adapted for connection to a source of gas under pressure and including a first valve means operable for forcing a purging stream of compressed gas from said source through said container head means and its inlet means, and a second valve means operable after closure of said first valve means for admitting liquid from the vessel or conduit through said inlet means into said sample container.

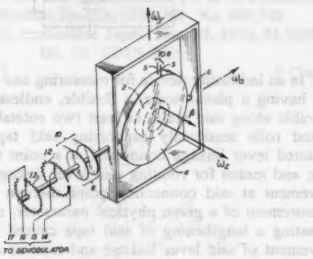
---

**4,213,343**

**KINEMATIC INERTIAL SENSOR**

**Jay Hoffman, Livingston, N.J., assignor to The Singer Company, Little Falls, N.J.**

**Filed Apr. 30, 1979, Ser. No. 34,110**
**Int. Cl.³ G01P *15/08***
**U.S. Cl. 73—505** **2 Claims**



1. A kinematic inertial sensor for measuring angular velocity and position relative to inertial space about one or more measurement axes including:

an angular rate sensor having a ring of conducting fluid contained in a housing which is mounted for rotation on an axis passing through and parallel to the plane of the ring and which has an electric signal output proportional to the rate of movement of the fluid in response to angular rate inputs in directions normal to the spindle axis,

a set of gimbals for supporting the angular rate sensor for motion about axes orthogonal to the spindle axis,

means for generating electric signals relating position of the rate sensor about an axis normal to the spindle axes,

means for applying accelerating torque to each of the gimbals,

means for measuring the angle of each gimbal with respect to a vehicle frame,

means for resolving the angular rate proportional signal of the accelerometer into components related to the measurement axes,

means for processing each component to produce a signal proportional to the angular rate, and

means for applying the control signals so produced to the gimbal torquers to offset the angular rate experienced by the rate sensor.

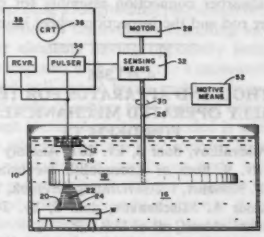
---

**4,213,344**

**METHOD AND APPARATUS FOR PROVIDING DYNAMIC FOCUSSING AND BEAM STEERING IN AN ULTRASONIC APPARATUS**

**Joseph L. Rose, Churchville, Pa., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.**

**Filed Oct. 16, 1978, Ser. No. 951,490**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—620** **14 Claims**



1. An ultrasonic apparatus for changing the path and focal zone length of an ultrasonic energy search beam comprising:

ultrasonic energy transmitting means coupled for transmitting an ultrasonic energy search beam toward an object to be examined;

acoustic lens means interposed in the path of said search beam from said transmitting means to the object, said lens means having a contoured groove surface for changing the focal zone length and the path of said search beam, and

motive means coupled to said lens means for causing said search beam responsive to motion of said lens means in a plane substantially normal to the search beam path to change focal zone length and beam path in a predetermined scan pattern to cause a scan of the object portion in the path of said beam.

---

**4,213,345**

**PIPE INSPECTION SYSTEM AND METHOD**

**Martin J. Dufour, Crowley, La., assignor to W. C. Lamb, Lafayette, La.**

**Filed Jul. 25, 1978, Ser. No. 927,944**
**Int. Cl.² G01N *29/04***
**U.S. Cl. 73—637** **7 Claims**

1. A carriage/inspection wheel assembly for holding the inspection wheel thereof in continuous contact with a rotating pipe where there is relative longitudinal movement between the assembly and the pipe, comprising:

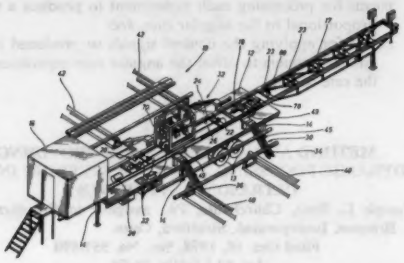
a frame defining a major axis substantially parallel to the axis of the pipe being inspected;

a fluid cylinder having an associated rod and being mounted on said frame, said rod being disposed substantially perpendicular to the axis of the pipe;

an ultrasonic inspection wheel;

a head assembly comprising an inspection wheel housing for rotatably mounting the inspection wheel with the axis of rotation of the inspection wheel substantially parallel to the major axis of the frame;

each wheel housing being connected to a plurality of support rollers which engage the rotating pipe, said support rollers being angled at an acute angle relative to a plane perpendicular to the pipe axis where such acute angle



approximates the pitch angle of the helix that the wheel traces on the pipe; and

a shock absorber connection assembly for connecting the cylinder rod and the inspection wheel housing.

---

## 4,213,346
## METHOD AND APPARATUS FOR TESTING CYCLICALLY OPERATED MECHANICAL MEMBERS FOR DEFECTS

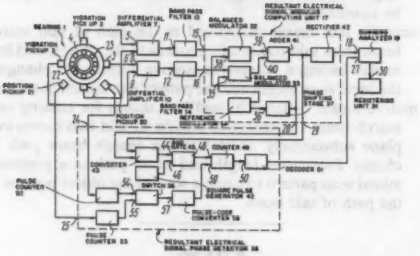
**Sergei V. Polovnikov, dom 3, kv. 207; Anatoly M. Zaznobin, dom 22, kv. 9, both of Krasnoobsk Novosibirskoi oblasti; Gennady F. Masalov, 1 Televizionny pereulok, 7, Novosibirsk, and Alexandr A. Mischenkov, dom 3, kv. 24, Krasnoobsk Novosibirskoi oblasti, all of U.S.S.R.**

**Filed Oct. 6, 1978, Ser. No. 949,376**

**Claims priority, application U.S.S.R., Dec. 5, 1977, 2551865**

**Int. Cl.[2] G01N *29/04***

**U.S. Cl. 73—660** **3 Claims**



3. A device for testing cyclically operated mechanical members for defects, said device comprising

at least two vibration pickups adapted to sense the vibration of a cyclically operated mechanical member under test, said vibration pickups having operating axes arranged at right angle to each other, mounted on said test member, and each having an output;

a plurality of adjustable band pass filters adapted to select a frequency range corresponding to the defects of the test member, each having inputs coupled to said outputs of said vibration pickups and each having an output;

a resultant electrical signal modulus computing unit having a plurality of inputs equal in number to said adjustable band pass filters and coupled to said outputs of said adjustable band pass filters, said computing unit having three outputs;

a summing analyzer having two inputs and an output, the first input of said summing analyzer being coupled to a first output of said three outputs of said resultant electrical signal modulus computing unit;

a registering unit having an input coupled to said output of said summing analyzer;

at least two position pickups adapted to determine the position of the test member, said position pickups being mounted on the test member and each having an output; and

a resultant electrical signal phase detector having a plurality of inputs, two of said inputs of said signal phase detector being coupled to two outputs of said resultant electrical signal modulus computing unit, said signal phase detector having an output coupled to said second input of said summing analyzer,

respective inputs of said resultant electrical signal phase detector being coupled to said outputs of said position pickups.

---

## 4,213,347
## INDICATING DEVICE FOR MEASURING AND CONTROL APPARATUS

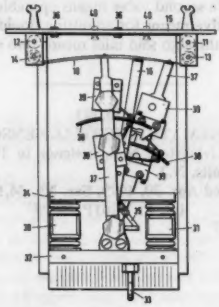
**Walter Metz, Moosbrunn, Fed. Rep. of Germany, assignor to Metz Mannheim GmbH, Mannheim, Fed. Rep. of Germany**

**Filed Apr. 13, 1979, Ser. No. 29,744**

**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816209**

**Int. Cl.[2] G01L *13/02, 19/12***

**U.S. Cl. 73—716** **11 Claims**



1. In an indicating device for measuring and control apparatus, having a planar scale, a flexible, endless indicator tape movable along said scale, at least two rotatable rigidly supported rolls tensionally supporting said tape, a pivotally mounted lever linkage connected at a point thereon to said tape, and means for rotating said lever linkage in an arcuate movement at said connection point thereon in response to measurement of a given physical parameter, means for compensating a lengthening of said tape caused by the arcuate movement of said lever linkage and tape at said connection point.

---

## 4,213,348
## SELF-CALIBRATING AUTOMATIC ZEROING STRAIN GAUGE CIRCUIT

**John E. Reinertson, Cedar Rapids, Iowa, and John L. Wells, Los Altos, Calif., assignors to MedaSonics, Inc., Mountain View, Calif.**

**Filed Aug. 1, 1979, Ser. No. 62,718**

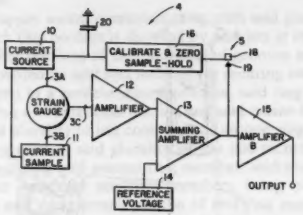
**Int. Cl.[3] G01L *9/04, 27/00***

**U.S. Cl. 73—765** **13 Claims**

1. A circuit for calibrating and providing an output from a strain gauge after said strain gauge is fitted to an object to be measured comprising:

a constant current source for providing a constant current in said strain gauge;

a source of a reference voltage; means responsive to an error signal corresponding to a difference between a voltage drop across said strain gauge due to said constant current and said reference voltage during a predetermined time period for adjusting the magnitude of the current from said current source in said strain gauge to reduce said




difference between said strain gauge voltage drop and said reference voltage; and

means responsive to a difference between said voltage drop across said strain gauge and said reference voltage after said adjusting of said current in said strain gauge for providing an output of said voltage difference relative to said reference voltage.

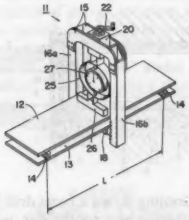
---

**4,213,349**

## METHOD OF AND APPARATUS FOR MEASURING STIFFNESS

**Koryo Miura, 3-9-7, Tsurukawa, Machida-Shi, Tokyo-To, Japan**

**Continuation of Ser. No. 754,240, Dec. 27, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,940**
**Claims priority, application Japan, Dec. 27, 1976, 51-159579**
**Int. Cl.³ G01N *3/20***
**U.S. Cl. 73—847** **9 Claims**



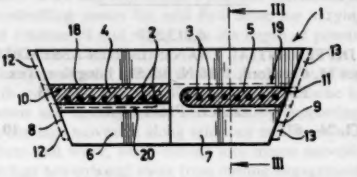
1. A method of measuring the stiffness of a test piece comprising the steps of combining an elastic member having a known stiffness, said test piece, and a rigid frame by means of fulcrums in a mirror image relationship so as to form a dynamics system, forcing said dynamics system to undergo a definite relative displacement through said fulcrums such that the deformation of said elastic member and that of said test piece will effect with each other without varying the linear relation between the load and the displacement of said system, and detecting the amount of relative displacement of said elastic member thereby determining the stiffness of said test piece.

**4,213,350**

## EDGE-ACTIVE BELT

**Alexandre Horowitz, and Martinus H. Cuypers, both of Eindhoven, Netherlands, assignors to Varitrac AG, Zug, Switzerland**

**Filed May 15, 1978, Ser. No. 906,346**
**Claims priority, application Netherlands, May 18, 1977, 7705534**
**Int. Cl.² F16G *5/10***
**U.S. Cl. 474—264** **8 Claims**



1. A belt comprising a longitudinal pull strand of high tensile strength and a series of transversely extending longitudinally spaced stiffener elements having oppositely facing end-surfaces angularly disposed with respect to a cross-sectional plane of said belt, said pull strand being enclosed in a continuous flexible molded body of rubber type material extending longitudinally through identical cavities provided in said transverse element and in which each transverse element is connected to the said body, said flexible continuous body being molded integrally with and adhering to said pull strand as well as being integral with and adhering to said transverse elements as the sole interconnecting means between the said elements sidewardly at least onto their said oppositely-facing end surfaces and further adhering to at least a portion of the side walls of the said elements along and beyond the edges of said cavities in each space between said elements.

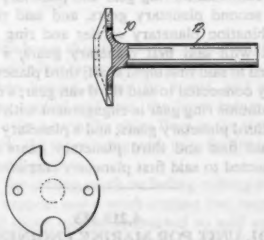
---

**4,213,351**

## STEERING SHAFT AND FLANGE AND METHOD OF MAKING SAME

**James S. Rowlinson, 346 Southcote Rd., Ancaster, Ontario, Canada (L9G 2W2)**

**Filed Jun. 2, 1977, Ser. No. 802,928**
**Claims priority, application Canada, Mar. 21, 1977, 274330**
**Int. Cl.² B62D *1/16***
**U.S. Cl. 74—492** **1 Claim**



1. A one piece, integrated steering shaft and flange for vehicles, said flange being located on the lower end of the steering shaft for connection to the steering mechanism of said vehicle, said flange being integrally formed on the end of said shaft by an upset forging process which includes the following steps:

(a) placing a ring which has a profiled face on a steel shaft;

(b) heating a portion of said shaft to a point where it is upsettable;

(c) placing the shaft and ring in the cavity of a die provided

with a profiled face which matches the profiled face of the ring, said ring being positioned with its profiled face lying in juxtaposition to said profiled face of the die cavity;
(d) closing said die;
(e) applying axially compressive force on the heated end of said shaft to deform and flow it along a pilot section of the die and into the die cavity until the same is filled;
(f) removing the compressive force from the shaft; and
(g) removing the formed component from the die and removing the ring from the shaft.

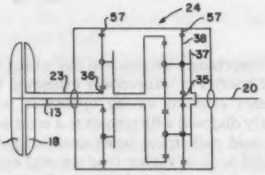
---

**4,213,352**

## DIFFERENTIAL TRANSMISSION ASSEMBLY

**Herbert M. Crawford, 1116 N. 8th St., Longview, Tex. 75601**

**Filed Mar. 14, 1978, Ser. No. 886,603**
**Int. Cl.[2] F16H *47/04***
**U.S. Cl. 74—677** **10 Claims**




1. A nonshifting transmission comprising
a first input shaft,
a second input shaft surrounding and concentric with said first input shaft,
an output shaft coaxial with said first input shaft, and
planetary gear means connected solely to said first and second input shafts and said output shaft so that no interconnection with any component stationary with respect to said input shafts and said output shaft is provided, said planetary gear means comprising a first sun gear affixed to said first input shaft; a first planetary carrier operatively attached to said output shaft; first planetary gears operatively connected to said first planetary carrier and said first sun gear; a second sun gear, affixed to said second input shaft; gearing means interconnecting said second sun gear and said first planetary gears; a combination ring gear and planetary carrier; second planetary gears operatively connected to said second sun gear, the planetary carrier of said combination ring gear and planetary carrier carrying said second planetary gears, and said ring gear of said combination planetary carrier and ring gear in engagement with said first planetary gears; a third sun gear, affixed to said first input shaft; third planetary gears operatively connected to said third sun gear; a double ring gear, said double ring gear in engagement with both said second and third planetary gears; and a planetary carrier common to said first and third planetary gears and operatively connected to said first planetary carrier.

---

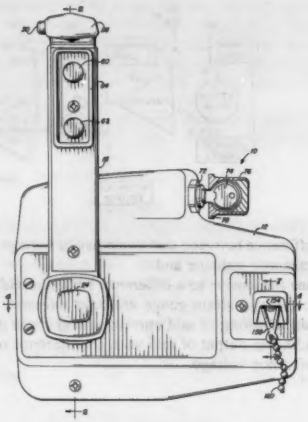
**4,213,353**

## CONTROL UNIT FOR MARINE ENGINES EMPLOYING THROTTLE ONLY CONTROL

**Larry A. Floeter, Campbellsport, Wis., assignor to Brunswick Corporation, Skokie, Ill.**

**Filed Mar. 6, 1979, Ser. No. 18,045**
**Int. Cl.[3] B60K *41/04***
**U.S. Cl. 74—878** **11 Claims**

1. A control unit for an engine of the type having a shift means for shifting between forward, neutral, and reverse and throttle means for controlling engine speed between idle and high speed, said control unit comprising:
(a) a housing;
(b) a control handle rotatably supported by said housing;
(c) a shift-throttle linkage means within said housing connected to each of said shift and throttle means and responsive to rotation of said handle for control of each of said shift and throttle means during portions of the arc of rotation of said handle;
(d) a throttle only shaft extending from said housing; and



(e) latch means operated by axial movement of said throttle only shaft to engage and disengage said shift means with said handle while permitting said handle to control said throttle means, said latch means including a latch pin biased toward a postion engaging said shift means with said handle.

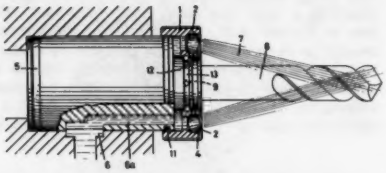
---

**4,213,354**

## METHOD AND MEANS FOR COOLING DOWN A STATIONARY TWIST DRILL BY A COOLANT

**Walter Dahinden, Port, Switzerland, assignor to Dornag, Berne, Switzerland**

**Filed Sep. 6, 1978, Ser. No. 940,298**
**Claims priority, application Switzerland, Sep. 15, 1977, 11319/77**
**Int. Cl.[2] B23B *1/00, 27/10***
**U.S. Cl. 82—1 C** **5 Claims**



1. A method for cooling down a twist drill having a plurality of grooves formed therein on a toolholder, which drill remains stationary during the working process, coolant being supplied onto said drill through a conduit bored in said toolholder and through a plurality of jets, mounted on a rotatable ring disposed on said toolholder, which comprises:
adjusting said rotatable ring so as to align said plurality of jets so as to correspond to said plurality of grooves;
supplying the coolant under pressure through said plurality of jets in a plurality of simultaneous concentrated streams separate from each other onto the plurality of grooves of said twist drill;
directing each of said streams of coolant at respective beginning portions of said plurality of grooves; and

initially limiting application of said streams of coolant to said respective beginning portions of said plurality of grooves.

2. A machine tool cooling assembly comprising:

a toolholder for holding a twist drill having a plurality of grooves formed therein;

a ring member rotatably mounted on said toolholder adjacent said twist drill;

a plurality of jets swivelably mounted on said rotatable ring member;

coolant supply means communicating with said plurality of jets such that coolant is directed by said jets at respective beginning portions of said plurality of grooves and

means mounted on said ring member for securing said plurality of jets in a predetermined position, said ring member including a countersunk portion and said means for securing said plurality of jets comprising a second ring member abutting each of said plurality of jets and securing members engaging said second ring member, said second ring member and said securing members being positioned within said countersunk portion of said ring member.

---

**4,213,355**

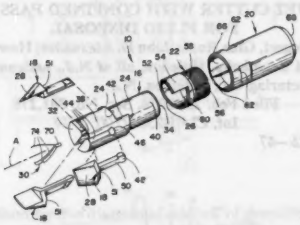
## ADJUSTABLE SOCKET

**David S. Colvin, 31324 Burbank, Farmington Hills, Mich. 48081**

**Filed Mar. 1, 1979, Ser. No. 17,981**

**Int. Cl.² B25B *13/12***

**U.S. Cl. 81—128** **14 Claims**



1. An adjustable socket comprising: a driver adapted to be rotatively driven about an axis of rotation thereof; a plurality of jaws mounted on the driver for radial movement with respect to the axis of rotation thereof; each of said jaws including a camming surface that is inclined in a radial direction along the axis of driver rotation; a jaw positioner movable axially on the driver to slidably engage the camming surfaces on the jaws in order to control the radial positions of the jaws and the size of a nut or bolt capable of being received and driven by the jaws under the impetus of driver rotation; a rotatable adjuster for moving the jaw positioner axially in order to move the jaws between fully opened and fully closed positions upon rotation of the adjuster no more than 360° about the axis of driver rotation; and a helical locking surface that extends about the driver axis an angular amount equal to the extent of adjuster rotation so as to provide locking of the adjuster in any adjusted position.

---

**4,213,356**

## WORK CUTTING

**Harry J. Armitage, 1546 Cavitt Rd., Monroeville, Pa. 15146**

**Continuation of Ser. No. 527,491, Nov. 26, 1974, abandoned.**

**This application Dec. 29, 1978, Ser. No. 974,348**

**Int. Cl.² B23B *3/06, 3/36***

**U.S. Cl. 82—2 B** **17 Claims**

1. Apparatus for cutting work including cutting-tool means including a work-cutting tool, a first drive including a variable-speed motor for rotating said work, a second drive including a variable-speed motor, connected to said cutting-tool means, for driving said tool into cutting engagement with said work as said work is rotated, means, connected to said first drive, for controlling the speed at which said work is rotated, means, including said controlling means, interconnecting said first drive and said second drive, for coordinating the speed at which said work is rotated and the speed at which said second drive drives said tool into cutting engagement with said work to set said speeds at magnitudes such that the rate at which said tool passes over said work in cutting relationship is maintained at a predetermined magnitude, said interconnecting means including means for generating a potential dependent on the speed of rotation of said work for controlling the speed of said second drive, and control means, positionally responsive to the penetration of the said tool in said work, and connected to said speed controlling means for said first drive for varying the speed of rotation of said work with the depth of penetration into said work of said tool.

8. In an apparatus for cutting in work of a groove of substantial depth and width the combination including a lathe having way means and having means for rotatably supporting said work, a carriage moveable along said way means towards and away from said work, work-cutting tool means moveable on said carriage towards and away from cutting engagement with said work, said work-cutting-tool means including a vertical

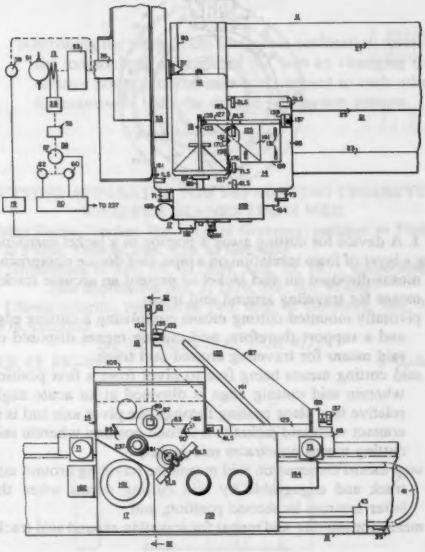


plate of smaller thickness than said width and of length greater than said depth, said plate tapering along the upper side thereof to a tip, said plate having at said tip a seat, and means for securing a cutting tool in said seat, the taper being along the side of the plate over which the chips flow as the tool engages and cuts said work, the taper being such as to facilitate the flow of chips out of said groove.

13. Apparatus for cutting work including cutting-tool means including a tool support and a work-cutting tool supported by said support and drive means, connected to said support for driving said tool into cutting engagement with said work, said work-cutting tool means also including means applying a thrust force to said support, generally perpendicular to the direction of the force applied to said work by said tool, to prestress said support generally perpendicular to said direction.

17. In an apparatus for cutting in work of a groove of substantial depth and width, the combination including a lathe having way means and having means for rotatably supporting said work, a carriage moveable along said way means towards and away from said work, work-cutting tool means moveable

on said carriage towards and away from said work, said work-cutting tool means including a vertical plate of smaller thickness than said width and of length greater than said depth, a cutting tool extending from said plate to a position where said tool is engageable with said work for cutting said work, said plate extending from said tool laterally towards the position of said work so as to be under said work and being formed so as to clear the work, the extension of said plate adding support for the tool and thus adding a greater bearing surface for loads applied through said tool.

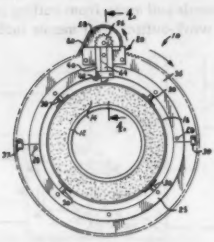
---

**4,213,357**

## CUTTING DEVICE FOR PIPE JACKETS

**Steven A. Lively, Dewey, and Richard B. Gwin, Bartlesville, both of Okla., assignors to H. C. Price Co., Bartlesville, Okla.**

**Filed Sep. 18, 1978, Ser. No. 943,103**
**Int. Cl.² B23B *3/22, 3/04***
**U.S. Cl. 82—4 C** **1 Claim**



1. A device for cutting away a portion of a jacket surrounding a layer of foam insulation on a pipe, said device comprising:
means disposed on said jacket to present an arcuate track;
means for traveling around said track;
pivotally mounted cutting means comprising a cutting edge and a support therefore, said cutting menas disposed on said means for traveling around said track,
said cutting means being free to pivot from a first position wherein said cutting edge is disposed at an acute angle relative to a plane passing through the pivot axis and is in contact with said jacket to a second position wherein said cutting means penetrates said jacket;
stop means disposed on said means for traveling around said track and engageable by said cutting means when the latter assumes its second position; and
means for moving said means for traveling around said track.

---

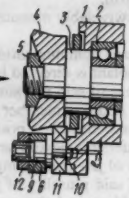
**4,213,358**

## ROTARY CUTTING TOOL

**Petr I. Yascheritsyn, Leninsky prospekt, 18, kv. 102; Valery A. Sidorenko, Leninsky prospekt, 14, kv. 3; Evgeny I. Morgunsky, ulitsa Malaya, 15, kv. 1; Nikolai V. Vishnev, ulitsa Karastoyanovoi, 23, kv. 82, all of Minsk; Mindaugas N. Bureika, ulitsa Veterinarious, 12, kv. 74, Litovskaya SSR, Ukmerge; Vladimir A. Plotnikov, ulitsa Gikalo, 28, kv. 17, Minsk, and Anatoly T. Volkov, ulitsa Krasnaya, 25, kv. 15, Minsk, all of U.S.S.R.**

**Filed Sep. 19, 1978, Ser. No. 943,649**
**Int. Cl.² B23B *29/00*; B26D *1/12***
**U.S. Cl. 82—36 R** **4 Claims**

1. A cutting tool with a freely rotating cutting edge comprising:
(1) a body having a leading end portion and a trailing end portion;
(2) bearing supports located in said leading end portion;
(3) rotatable spindle means having an axis of rotation and having bearing means rotatably mounted in said bearing supports;
(4) a cutting element having a continuous cutting edge mounted on said spindle for rotation therewith about said axis,
(5) said cutting edge having a portion thereof at said leading end and on one side of said axis,
(6) said portion of said cutting edge defining a cutting zone, and



(7) a spindle support means connected to said body on another side of said axis toward said trailing end and having pressure-applying means directed toward said leading end in order to counter pressure cutting forces on said spindle during machining operations to thereby subdue vibratory influences on said spindle and said cutting element.

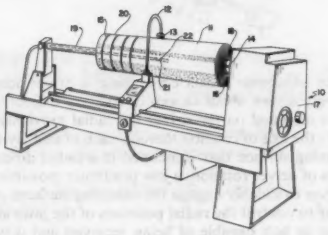
---

**4,213,359**

## FLUID JET CUTTER WITH CONFINED PASSAGEWAY FOR FLUID DISPOSAL

**Clayton Bogert, Glen Rock; John D. Alexander, Hawthorne, and Leonard Krautheim, Haledon, all of N.J., assignors to Lever Manufacturing Co., Paterson, N.J.**

**Filed Feb. 27, 1978, Ser. No. 881,278**
**Int. Cl.² B23B *1/00, 5/14***
**U.S. Cl. 82—47** **9 Claims**



7. Fluid jet cutter structure for cutting a roll of material in situ comprising
fluid jet cutter means including a fluid jet nozzle,
support means for operatively relatively rotationally supporting removably a roll of material to be cut in situ in a position along an axis in radially inwardly disposed relation to the nozzle for relative rotational movement between the roll of material and the nozzle about the axis, and
fluid receiving means operatively disposed radially inwardly of the position of the roll of material for collecting spent fluid comprising
a shaped block for receiving the steady flow of a substantially continuous stream of fluid from the nozzle of the high pressure fluid jet after the fluid has passed through material to be cut or slit, and including an entry port, an exit port and a flow diverting passage therebetween for directing the flow of the fluid after entering the entry port out of its normal incoming flow path to prevent the return of the fluid through the entry port back to the material which has been cut or slit,
the nozzle being selectively disposed in operatively flow

aligned relation to the receiving means at a point along the axis for causing a fluid jet exiting from the nozzle to cut circumferentially into and through the roll of material in situ at such point and be collected by the receiving means during relative rotational movement between the nozzle and the roll of material,

said flow diverting passage including a curvo-linear conduit portion between the entry port and exit port and lying in a common plane with such entry port and exit port and having a curved impingement portion in alignment with the entry port for receiving the spent fluid and for directing such fluid substantially linearly continuously farther along such conduit portion to the exit port.

---

**4,213,360**

## PROCESS FOR PRODUCTION OF INDIVIDUAL PORTIONS FROM BLOCKS OF DEEP-FROZEN FOODSTUFFS

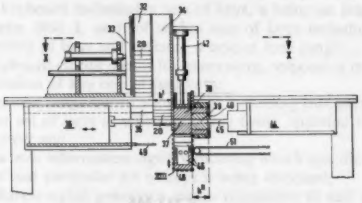
**Karl Hartmann, D 285 Bremerhaven 3, Brinkmannstrasse 6, Fed. Rep. of Germany**

**Filed Mar. 28, 1978, Ser. No. 890,952**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715535**

**Int. Cl.² A22C *125/18*; B26D *3/24***

**U.S. Cl. 83—15** **7 Claims**



1. A method for the division of a block of deep-frozen foodstuffs, especially a frozen block of fish filets, into portions of predetermined size, the method utilizing a processing device operating at temperatures between −6° C. and −30° C. and at a pressure of at least 100 at. and comprising:

squeezing the block in a first direction perpendicular to its largest surface through a first blade lattice formed of parallel knives positioned in such manner as to define openings narrowed in the direction of movement thereby carving the block into a row of plates of uniform thickness by first cuts perpendicular to a given surface of the block;

simultaneously squeezing the block in a direction perpendicular to said first direction so that the height of the plates is greater than the height of the block; and

carving the plates formed by squeezing the block through the first blade lattice into portions of predetermined size by performing second cuts perpendicular to said first cuts, the second cuts also being perpendicular to the largest surface of the frozen block of fish fillets.

---

**4,213,361**

## PERFORATION METHOD

**Seppo Kanervo, Espoo, Finland, assignor to Oy Wartsila AB, Helsinki, Finland**

**Filed Mar. 15, 1978, Ser. No. 886,570**

**Claims priority, application Finland, Mar. 18, 1977, 770856**

**Int. Cl.² B26F *1/24, 1/20***

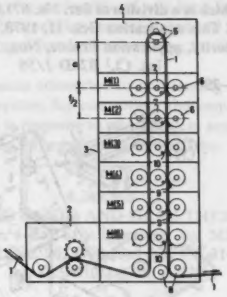
**U.S. Cl. 83—30** **9 Claims**

1. A method for providing a running web with a perforation pattern fitting into printed image units successively printed on the web, the method including the steps of:

longitudinally perforating the web in a separate longitudinal perforator as the web is moved therethrough; and,

transversely perforating the web in a transverse perforator to provide a plurality of transverse perforation rows comprising:

passing the web through a plurality of separate perforation units, one for each of the transverse perforation rows, and



controlling the pitch of the transverse perforation rows in the longitudinal direction of the web by changing the relative position of the units with respect to each other in accordance with the desired perforation pattern.

---

**4,213,362**

## CUTTING APPARATUS FOR SEPARATING CIGARETTE WRAPPER BLANKS FROM WEB

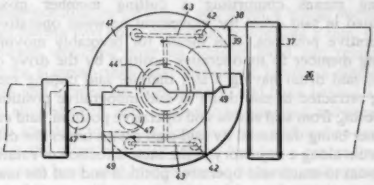
**Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany**

**Continuation of Ser. No. 827,634, Aug. 25, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,697**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639216**

**Int. Cl.² B31B *1/16, 1/20, 41/14***

**U.S. Cl. 83—100** **6 Claims**



1. Apparatus for successively separating blanks for wrappers, particularly cigarette packs, from a continuous web of packaging material including a plurality of blank pairs arranged laterally to the direction of conveyance of said web, the blanks in each pair being rotated 180° opposite each other and laterally displaced relative to each other, said apparatus comprising:

(a) a punch having first and second cutting edges,

(b) a first counter edge fixed beneath said punch, aligned and cooperating with said first cutting edge of said punch,

(c) means moving said punch downward relative to said first counter edge to separate a pair of blanks from the web,

(d) a turntable arranged beneath said punch,

(e) a second counter edge on the turntable oriented in the direction of conveyance of said web and cooperating with said second cutting edge on said punch wherein additional downward movement of said punch separates the respective blanks in each blank pair, and

(f) means for rotating said turntable and said blanks 180°.

**4,213,363**

## APPARATUS FOR THE CUTTING AND SIMULTANEOUS DISPENSING OF A WEB OF ROLL MATERIAL

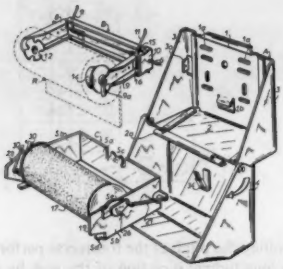
**Maurice Granger, 28 rue Charles de Gaulle, 4200 Saint-Etienne, Loire, France**

**Continuation of Ser. No. 814,931, Jul. 12, 1977, Pat. No. 4,122,738, which is a division of Ser. No. 671,818, Mar. 30, 1976, abandoned. This application Oct. 11, 1978, Ser. No. 950,293**

**Claims priority, application France, Nov. 19, 1975, 75 36254**

**Int. Cl.[2] B26D *1/56***

**U.S. Cl. 83—298** **23 Claims**



1. An apparatus for successively cutting and simultaneously distributing sections from a web of roll material, the apparatus having a casing, a carrier for a roll of material mounted in the casing, a rotatable drum in said casing, said carrier being urged towards said drum such that the roll of material is frictionally engaged with the drum to cause the drum to be driven in rotation by manual traction applied to a free end of the material extending from the casing, means operatively associated with said drum for braking the rotation of said drum and halting the drum after one revolution thereof, energy storage means operatively associated with said drum for resisting rotation of the drum during an initial period of rotation thereof while storing energy and then driving the drum in rotation by the stored energy, and cutting means for cutting the material on said drum, an improvement wherein said drum is hollow, said cutting means comprising a cutting member pivotably mounted in said drum for movement between operative and inoperative positions, cam means for pivotably moving the cutting member to its operative position by the drive of the drum, said drum having a slot therein, said cutting member being retracted in said drum in said inoperative position and projecting from said slot in said operative position, said cutting member being displaced by said cam means under the drive of the drum along a trajectory in the same direction of rotation of the drum to reach said operative position and cut the material to free a section thereof for release under the manual traction in the course of rotation of the drum.

---

**4,213,364**

## DEVICE FOR A PORTABLE POWER SAW

**Hans O. Sahlin, Langgjovagen 21, Tyreso, Sweden (S-135 00)**

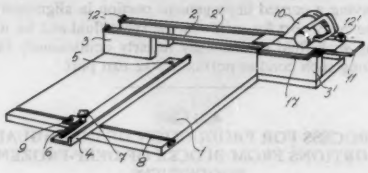
**Filed Aug. 31, 1978, Ser. No. 938,451**

**Claims priority, application Sweden, Sep. 5, 1977, 7709957**

**Int. Cl.[2] B27B *5/20***

**U.S. Cl. 83—471.3** **3 Claims**

1. In a device for use with a portable power saw wherein the saw is supported for linear movement on parallel guide bars above a base plate whereby the saw blade extends below the guide bars to cut the workpiece which is supported beneath it, the improvement comprising a guide plate to which the saw is attachable adapted for sliding movement on said guide bars, said guide bars being basically rectangular in cross-section, guide blocks depending from the bottom of said guide plate in abutting sliding relation with both sides of at least one of said guide bars, support blocks attached at their lower ends to the base plate and at their upper ends to the ends of said guide bars to support the guide bars in spaced relationship to the base plate, a work piece guide comprising an elongated bar shaped member pivotally connected at one end in proximity to the guide bars and having an elongated slot in the other end extending substantially parallel to the longitudinal axis of the work piece guide, an inverted T slot in the top face of the base plate under the slot in the work piece guide and substantially



parallel to the guide bars, a threaded knob extending through said slots and engaging a threaded member within said T slot adapted to clamp the work piece guide in any desired angular position with respect to the guide bars, the height of the guide bars above the base plate being adjustable by providing a plurality of hollow support blocks having means to attach them to each other.

---

**4,213,365**

## PRESS

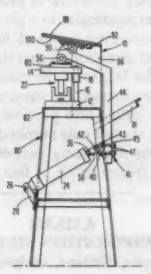
**Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901**

**Continuation of Ser. No. 736,823, Oct. 29, 1976, Pat. No. 4,080,860, which is a continuation-in-part of Ser. No. 650,926, Jan. 21, 1976, Pat. No. 4,004,480. This application Mar. 16, 1978, Ser. No. 887,258**

**The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.**

**Int. Cl.[2] B26D *5/12***

**U.S. Cl. 83—530** **15 Claims**



1. A press comprising:

(a) a frame;

(b) at least one die member fixedly mounted on said frame;

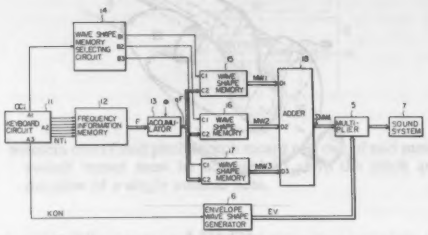
(c) at least one lever and punch means adjacent said die member for moving toward and away from said die member; and

(d) at least one actuating means operatively connected to said lever and punch means for exerting forces against and causing movement of said lever and punch means.

## 4,213,366
## ELECTRONIC MUSICAL INSTRUMENT OF WAVE MEMORY READING TYPE

**Koji Niimi; Mitsumi Katoh, and Masatada Wachi, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan**

**Filed Nov. 1, 1978, Ser. No. 956,876**
**Claims priority, application Japan, Nov. 8, 1977, 52-133119**
**Int. Cl.[2] G10H *1/00, 5/00***
**U.S. Cl. 84—1.01** **13 Claims**




1. An electronic musical instrument, comprising:

(A) a keyboard including n sets of keys, n being an integer greater than 1, each of said n sets of keys including a plurality of keys and defining a unique tone range;

(B) keyboard circuit means for generating, responsive to the operation of any one of said keys:

(1) a tone range information signal indicating that particular set of keys in which said key being operated is located; and

(2) a note information signal indicating which specific key in said particular set of keys is being operated;

(C) address signal generator means responsive to said note information signal for generating a series of address signals corresponding to said key being operated;

(D) a plurality of wave shape memories each responsive to said address signals and each generating a musical tone wave shape unique thereto upon receipt of both said series of address signals and an enabling signal applied thereto;

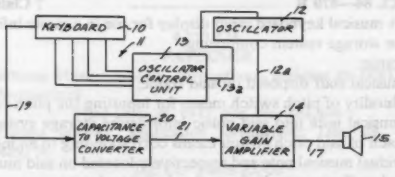
(E) wave shape memory selecting circuit means for applying enabling signals to selected ones of said wave shape memory means as determined by said tone range information signal; and

(F) sound system means responsive to the musical tone wave shapes generated by said wave shape memories for generating an audio signal determined thereby.

## 4,213,367
## MONOPHONIC TOUCH SENSITIVE KEYBOARD

**Robert A. Moog, Williamsville, N.Y., assignor to Norlin Music, Inc., Lincolnwood, Ill.**

**Continuation of Ser. No. 591,853, Jun. 30, 1975, abandoned.**
**This application Feb. 28, 1978, Ser. No. 882,262**
**Int. Cl.[2] G10H *1/02, 5/00***
**U.S. Cl. 84—1.22** **13 Claims**




1. In an electronic musical instrument having a keyboard with a plurality of keys, a tone signal generator for producing a tone signal, means for controlling said tone signal generator is response to operation of said keys and an output system for receiving said tone signal and converting the same into sound waves, the combination comprising:

(a) sensing means underlying all of the keys of said keyboard and responsive to a plurality of said keys for sensing the force with which said keys are operated and for producing a signal having a level corresponding to the sum of said forces, and

(b) amplifier means connected to said sensing means and to said output system for controlling the amplitude of said sound waves in response to said signal, in accordance with the sum of the forces of the operated keys.

## 4,213,368
## SOUNDING BANJO AND HEAD THEREFOR

**Mark S. Cox, Rte. 1 Box 61A, Hiwassee, Va. 24347**

**Filed Dec. 20, 1978, Ser. No. 971,316**
**Int. Cl.[2] G10D *1/10, 3/02***
**U.S. Cl. 84—269** **4 Claims**

1. An improved sounding banjo which comprises a drum, a tailpiece mounted on the side of said drum, a bridge and several strings having two ends, said drum comprising a thin, flexible membrane stretched over an annular band and retained in place by a metal rings, said membrane having a single hole therein and located on its periphery, said band having a neckpiece aligned with and located opposite said tailpiece, said strings attached to said neckpiece at one end and to said tailpiece at the other end, said strings forming a center line path across said head, said bridge placed between said strings and said membrance wherein the improvement comprises positioning said membrane such that said hole is at an approximately 60° angle from said center line path as measured substantially from the center of said head and near said neckpiece.

## 4,213,369
## APPALACHIAN DULCIMER LAPBOARD

**Robert L. Swartwout, 7409 Baltimore Ave., Takoma Park, Md. 20012**

**Filed Jun. 27, 1978, Ser. No. 919,669**
**Int. Cl.[3] G10G *5/00***
**U.S. Cl. 84—284** **13 Claims**

1. Apparatus for supporting a dulcimer on a person's lap, said apparatus comprising:

first means for supporting and gripping said dulcimer;

means attached to said first means for grasping the person's legs, whereby said apparatus and said dulcimer are held in substantially fixed position on the person's lap;

said first means including a substantially planar base member and support means in operative relationship with said base member for receiving said dulcimer and for positioning

said dulcimer in spaced apart relationship with respect to said base member; and

said support means including first support members fixedly attached to and adjacent a first end of said base member

and extending above the substantially planar surface of said base member, and second support members movably attached to and adjacent to a second end of said base member and extending above the substantially planar surface of said base member.

---

**4,213,370**

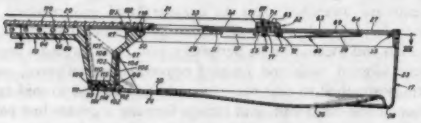
**MOLDED PLASTIC GUITARS**

**Charles E. Jones, Evanston, Ill., assignor to WMI Corporation, Chicago, Ill.**

**Filed Jun. 22, 1978, Ser. No. 918,059**

**Int. Cl.[2] G10D** *3/00, 3/04, 3/14*

**U.S. Cl. 84—291** **44 Claims**



1. A musical instrument of the guitar type, having a soundbox body to which is attached a neck having a tuning machine head, a top panel on said body carrying a bridge and saddle, strings attached at one of their ends to said bridge and extending across said saddle and connected at opposite ends to tuning gear of the machine head, said top panel having a sound hole under said strings, the improvement comprising:

said body being of plastic and formed in one piece and having a substantially rigid wall defining the perimeter of the body and extending upwardly from juncture with a shaped bottom;

said bottom having a concave-convex parabolic sound reflector area;

said sound reflector area having its perimeter upwardly inset relative to the lower edge of said wall;

and a bracing rib of substantially open generally S-shaped cross-section considered across the bracing rib, and joining said sound reflector area to the lower end of said wall on respective angular open junctures and without interfering with resonance vibrational qualities of the sound reflector area.

**4,213,371**

**AXIAL FLOW VALVE**

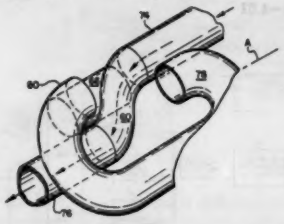
**Orla E. Thayer, P.O. Box 473, Waldport, Oreg. 97394**

**Continuation of Ser. No. 764,028, Jan. 31, 1977, Pat. No. 4,112,806. This application Jul. 24, 1978, Ser. No. 927,565**

**The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.**

**Int. Cl.[2] G10D** *9/04*

**U.S. Cl. 84—390** **11 Claims**



1. In a musical wind instrument having a slide loop, an instrument pipe with a mouthpiece at one end and an instrument pipe terminating in an instrument bell, the improvement comprising a rotary valve which includes:

a casing having a first end plate which defines primary and secondary body inlet apertures and having an opposed, second end plate defining primary and secondary body outlet apertures; and

a rotor rotatable in said casing having a primary rotor passage which connects said primary body inlet aperture to said primary body outlet aperture when said rotor is in a first position and which connects said secondary body inlet aperture with said primary body outlet aperture when said rotor is rotated to a second position, said rotor also having a secondary rotor passage which connects said primary body inlet aperture to said secondary body outlet aperture when said rotor is in said second position;

one of said instrument pipes connecting to said primary body inlet aperture;

the other of said instrument pipes connecting to said primary body outlet aperture;

one end of said loop connecting to said secondary body inlet aperture;

the other end of said loop connecting to said secondary body outlet aperture.

---

**4,213,372**

**ELECTRONIC TYPE MUSIC LEARNING AIDS**

**Takehiko Sasaki, Yamatokoriyama, and Yuji Yashiro, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed May 24, 1978, Ser. No. 908,958**

**Claims priority, application Japan, May 27, 1977, 52-62307; Jun. 7, 1977, 52-67457; Jun. 7, 1977, 52-74383**

**Int. Cl.[2] G09B** *15/04*

**U.S. Cl. 84—470 R** **7 Claims**

6. A musical keyboard input display for use in a music information storage system comprising:

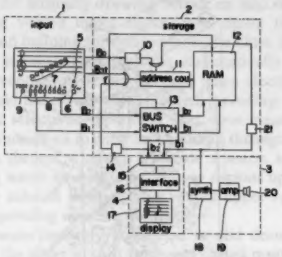
a frame;

a musical staff disposed on said frame;

a plurality of pitch switch means for inputting the pitch of a musical note into said music information storage system, each of said pitch switch means corresponding to an individual musical note and respectively located on said musical staff means to indicate that individual note;

a plurality of meter switch means disposed on said frame for inputting the duration of a musical note into said music information storage system, each of said meter switch

means corresponding to a particular musical note duration; and




wherein one of said pitch switch means and one of said meter switch means must be actuated to store the pitch and duration of a single musical note.

---

**4,213,373**

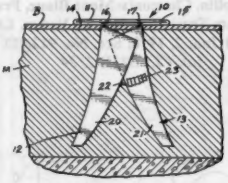
## SHEET METAL NAIL WITH LOCKABLE LEGS

**Robert L. Hallock, 7136 NE. 8th Dr., Boca Raton, Fla. 33431**

**Filed Dec. 12, 1978, Ser. No. 968,878**

**Int. Cl.[2] E01B *9/12*; F16B *15/04***

**U.S. Cl. 85—11** **2 Claims**



1. A sheet metal nail for attaching covering material to a lightweight insulating base material comprising, an enlarged head, a shank connected at one end to said head, said shank including a pair of generally U-shaped legs each of which includes a pair of generally parallel sides connected by a bight portion, the sides of one of said legs being received within the other leg and defining a hollow enclosure before being driven, the other end of said shank being of substantially the same dimension as said one end and defining a penetrating portion, the bight portion of at least one of said legs being curved toward the other leg intermediate the ends for causing said leg to be deflected outwardly when the nail is driven into the base material, said curved bight portion causing said legs to spread apart to an included angle of approximately 25°, at least one of said legs having an outwardly extending projection which is bent toward the other leg to retain said legs in interfitting relationship with each other, and said projection forming a mechanical lock to hold said legs in spread apart condition, whereby withdrawal of said nail is substantially prevented when said legs are locked in spread apart condition.

---

**4,213,374**

## FASTENER

**Balthasar Hüsler, Goldau, Switzerland, assignor to HNT AG, Switzerland**

**Filed Dec. 20, 1977, Ser. No. 862,648**

**Claims priority, application Switzerland, Dec. 29, 1976, 16439/76**

**Int. Cl.[2] F16B *15/00***

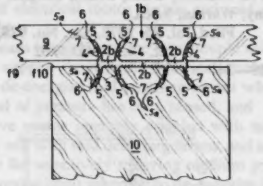
**U.S. Cl. 85—13** **15 Claims**

1. A fastener, comprising:

a base portion,

at least two anchor legs projecting from said base portion in the same general direction, said two anchor legs having a pair of remote surfaces on the respective outer sides of said legs and a pair of proximate surfaces on the respective inner sides of said legs,

at least one barb-like projection disposed on at least two of the surfaces of the group of surfaces comprising the two remote surfaces on the outer sides of said legs and the two proximate surfaces on the inner sides of said legs,



a small bevel located on each of said legs on the same side as said barb-like projection and slanting towards the other, opposite surface of each of said legs towards the free ends of each of said legs,

a large bevel located on each of said legs, each of said large bevels being on the side of each leg opposite said small bevel and slanted towards the free ends of said legs, so that said large bevels form wedge-like cutting edges with said small bevels at the free ends of said anchor legs.

---

**4,213,375**

## FIREARM SAFETY DEVICE

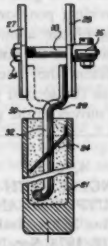
**Keith Pedler, Lot 1, Upper Gilston Rd., Gilston, Queensland 4211, Australia**

**Continuation-in-part of Ser. No. 791,111, Apr. 26, 1977, abandoned. This application Apr. 14, 1978, Ser. No. 896,537**

**Claims priority, application Australia, Jun. 24, 1977, PD0553**

**Int. Cl.[2] F41C *21/14***

**U.S. Cl. 89—31** **31 Claims**



1. A safety device for firearms comprising:

securing means for removably attaching said device in an operative position on a firearm;

a cup having a floored end and an unfloored end;

a resilient plastic projectile absorbing medium in said cup;

a substantially U-shaped rod having its crotch position embedded within said projectile absorbing medium and its free ends attached to said securing means to connect said projectile absorbing medium and said cup to said securing means so that when said device is located in the operative position on a firearm the unfloored end of the cup and the open end of the firearm barrel are in mutual confrontation with said cup and projectile absorbing medium held in front of the firearm barrel in the path of a projectile discharged from the firearm barrel to safely contain such projectile and arrest the motion thereof, while permitting

limited relative movement between said cup and projectile absorbing medium and said securing means on impact of a discharged projectile on said projectile absorbing medium.

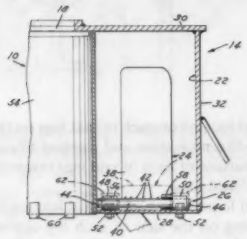
---

**4,213,376**

## STORAGE AND FEEDING APPARATUS FOR AMMUNITION BELTS

**Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Company, Warren, Mich.**

**Filed Jul. 26, 1978, Ser. No. 928,202**
**Int. Cl.[2] F41D 9/02**
**U.S. Cl. 89—34** **14 Claims**



1. Apparatus for storing and feeding an ammunition belt comprising: a storage compartment for an ammunition belt that is adapted to feed an automatic gun upon movement of the belt through the compartment in a feed direction; a plurality of dividers spaced along the feed direction within the compartment; means mounting the dividers within the compartment for movement between first and second positions; the dividers extending across the feed direction in the first positions thereof so as to provide storage of the ammunition belt in a serpentine configuration within the compartment; the dividers being movable to the second positions thereof extending along the feed direction so as to allow the ammunition belt to pass thereby upon movement to the gun; each divider including a detent for initially providing positioning thereof in the first position during loading of the ammunition belt within the compartment; and a closure for the compartment movable to a closed position to undetent the detent and thereby permit movement of dividers to the second positions thereof as the stored ammunition belt moves to the gun.

---

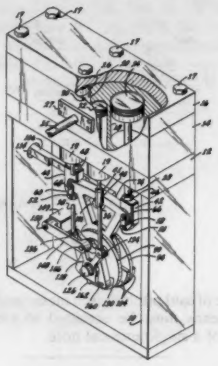
**4,213,377**

## RECIPROCATING ENGINE WITH IMPROVED POWER OUTPUT MEANS

**John H. Hedger, P.O. Box 357, Lakeside, Calif. 92040**

**Filed Dec. 18, 1978, Ser. No. 970,862**
**Int. Cl.[2] F01L 31/08; F01B 1/00**
**U.S. Cl. 91—187** **3 Claims**

1. In a fluid driven reciprocating engine which comprises an engine block containing at least two parallel cylinders, a piston located in each of said cylinders for parallel reciprocating movement therein, piston rods rigidly connected to each of said pistons extending out of said cylinders along the cylinder centerlines into a housing containing connecting means operatively connecting one end of each of said piston rods to a single crank pin on a rotary output shaft, and valve means within said block for selectively supplying fluid to and exhausting fluid from said cylinders above and below said pistons, the improvement wherein said crank pin is offset from the center of a disk shaped output plate having a central opening surrounding and secured to said rotary output means, a disk shaped timing plate fastened to said crank pin in an offset relationship so that said output plate and timing plate rotate together, and timing means fastened to said timing plate along the centerline of said crank pin, said timing plate connected to said valve means, whereby



the position of said timing means may be varied to vary the positions of said valves relative to piston position.

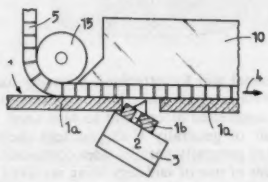
---

**4,213,378**

## METHOD AND APPARATUS FOR REMOVING WASTE PIECES FROM A PRE-CUT SHEET

**Jean-Claude Rossollin, Chamonix-Mont-Blanc, France, assignor to United Patents Trust Reg.-U.P.T., Vaduz, Liechtenstein**

**Filed Jun. 2, 1978, Ser. No. 912,011**
**Int. Cl.[3] B31B 1/74**
**U.S. Cl. 93—36 A** **8 Claims**



1. In a method of removing waste pieces from a pre-cut sheet having cut portions and waste pieces therein, which method includes the steps of impaling the waste pieces on stripping needles and separating the waste pieces from the cut portions by moving the needles rotatively relative to the cut portions, the improvement which comprises carrying out said impaling step while conveying said sheet and said needles along respective substantially parallel rectilinear paths and at the same rate of travel, and thereafter carrying out said separating step while applying suction to said cut portions, said application of suction causing a force to be exerted on said cut portions in opposition to the force exerted on said waste pieces by said needles during the separating step.

---

**4,213,379**

## EMERGENCY VENTILATION SYSTEM FOR ENCLOSED LIVESTOCK CONFINEMENT STRUCTURES

**Harold D. Cromley, Marshall, Mo., assignor to Marshall Equipment Co. Inc., Marshall, Mo.**

**Filed Mar. 13, 1978, Ser. No. 886,035**
**Int. Cl.[2] F24F 13/00; A01K 31/00; E05F 15/20**
**U.S. Cl. 98—33 R** **9 Claims**

1. For use with an enclosed building having vented upper regions placing the interior of said building in airflow communication with the outside atmosphere and having normally

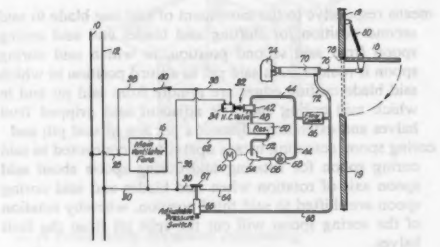
closed access door means in the lower regions thereof, and of the type including normally energized, electrically driven fan means connected to an electrical power supply and coupled between said lower regions of said building and said outside atmosphere for normally drawing outside air into said building through said vented upper regions and down through the interior of said building for exhaust from the latter out through said lower regions, apparatus for automatically providing emergency ventilation of said building when electrical power service to said fan means is interrupted, including:

means for selectively operating said door means to allow cooler outside air to enter said building through said lower regions thereof whereby to create a warm air draft for forcing warm air within said lower regions upwardly for outside exhaust through said vented upper regions, said door operating means comprising—

biasing means operably connected to said door means for urging the latter to shift from said closed position thereof toward an open position;

control means operably connected to said door means and to said electrical power supply for selectively opening and closing said door means, said control means normally releasably retaining said door means in said closed position thereof,

said control means being actuated in response to interruption of electrical power service to said fan means to release said door means from its said closed position whereby to permit said biasing means to shift said door means to its said open position,



said control means comprising a bistate, power-driven motor member having a shiftable output element coupled with said door means, and being actuatable to a first operating state for releasing said door means from its said closed position to allow shifting of said door means to its said open position under the influence of said biasing means, and being further actuatable to a second operating state for shifting said door means against the influence of said biasing means from its said open position to its said closed position,

said motor member comprising a reciprocable piston device having a power input thereto adapted to receive a force transmitting flowable medium for driving said device,

means operably coupled with said motor member for actuating the latter between said first and second operating states thereof,

means operably coupled with said actuating means and said electrical power supply for detecting the flow of electrical power to said fan means,

said actuating means being responsive to said detecting means to actuate said motor member between said first and second operating states thereof in accordance with said flow of electrical power detected by said detecting means,

said actuating means including—

pumping means thereof operably coupled with said piston device input and having an input thereof adapted to be coupled with a source of said flowable medium,

said pumping means being operable for delivering a quantity of said flowable medium under pressure to said piston device whereby to drivingly energize the latter,

electrical motor means adapted to be coupled with said electrical power supply and coupled with said pumping means for energizing the latter to deliver said medium to said piston device,

means for sensing the pressure of said medium delivered by said pumping means to said piston device,

said sensing means including switchable circuit means and being operably coupled with said piston device input and between said electrical motor means and said electrical power supply,

said sensing means being operative to uncouple said electrical power supply from said electrical motor means whereby to de-energize said pumping means when a preselected level of pressure has been sensed, and

actuatable valve means operably coupled with said piston device input and with said detecting means, and actuatable by the latter for selectively relieving medium pressure to said piston device input whereby to de-energize the latter.

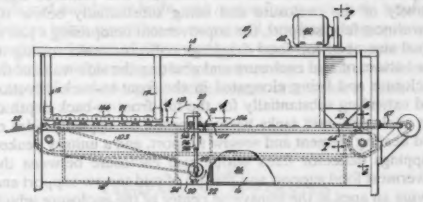
---

**4,213,380**

## COOKING MACHINE

**Arthur R. Kahn, 1218 Drexel Ave., Apt. 39, Miami Beach, Fla. 33139**

**Filed Jun. 18, 1979, Ser. No. 49,145**
**Int. Cl.³ A47J 37/00**
**U.S. Cl. 99—349** **3 Claims**



1. A mass cooking device for cooking meat patties and the like comprising:

a power driven conveyor belt means having a first dispensing end and a second exiting end and a middle zone defining a patty turnover zone, the conveyor means includes a conveyor belt endlessly rotating between the ends and defining a continuous loop, the belt includes elongated members spaced apart forming a grill thereby when the belt rotates it comprises a moving grill,

a pair of aligned ovens being a first and second oven, the first oven adjacent the dispenser end of the conveyor means, the second oven adjacent the exiting end of the conveyor means, both ovens adjacent the middle zone, means for dispensing meat patties on the belt at the dispensing end of conveyor means, a turnover means spaced between the ovens at the middle zone of the conveyor means comprising:

a V-shaped spatula having a pair of diverging legs, an upper and a lower leg, each leg comprising finger-like structures, the finger-like structures mating compatibly with the moving grill conveyor belt, the lower leg being normally below the belt, gear means coordinated with the conveyor means and the dispensing means for rotating the patty 180° after being captured by the spatula,

thereby the patties having been cooked on one side are reversed onto the other side for cooking by the second oven,

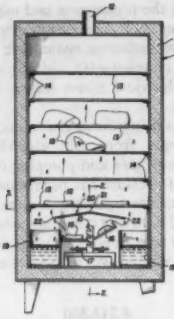
compressor means fixedly connected to the conveyor means above and aligned with the second oven for squeezing the meat patties tight against the belt, thereby the patties are compressed to attractive and easy to serve packages.

**4,213,381**

## SLOW COOKING APPARATUS

Clarence E. Ellis, 724 Monument Rd., Ponca City, Okla. 74601

Filed Dec. 18, 1978, Ser. No. 970,107
Int. Cl.[2] A47J *37/06*; A23B *4/04*
U.S. Cl. 99—446 1 Claim



1. In a slow cooking apparatus of the class having an upright top vented slow cooking enclosure, plural superposed vertically spaced food supports within said enclosure, a heating element and a seesaw support for smoldering fuel above the heating element, the heating element and seesaw support being disposed at the bottom of said enclosure and centered transversely of the enclosure and being substantially below the lowermost food support, the improvement comprising a pair of equal size open top food drippings collector tanks resting on the bottom of said enclosure and abutting the side walls of the enclosure and being elongated in the front-to-back direction and extending substantially for the full front-to-back depth of the enclosure, said tanks being disposed on opposite sides of said heating element and seesaw support, and a unitary peaked drippings deflector fixed within said enclosure between the lowermost food support and the top of said seesaw support and having an apex at the transverse center of the enclosure which is symmetrical in relation to the seesaw support and said tanks, said deflector having sloping panels on opposite sides of said apex which extend laterally outwardly of the seesaw support and somewhat outwardly of the interior longitudinal edges of said tanks to direct food drippings into the tanks, the longitudinal edges of said deflector being equidistantly widely spaced from the vertical sides of the enclosure so as to provide wide unobstructed heat riser passages between the edges of the deflector and the enclosure sides, and the deflector extending for the entire front-to-back depth of the enclosure so that no food drippings can fall onto the heating element and seesaw support.

---

**4,213,382**

## SELECTIVE PITTER FOR FRUITS OF THE DRUPE TYPE

Konrad E. Meissner, Lafayette, Calif., assignor to California Processing Machinery, San Ramon, Calif.

Filed Feb. 22, 1978, Ser. No. 880,229
Int. Cl.[3] A23N *4/04*, *4/22*
U.S. Cl. 99—486 8 Claims

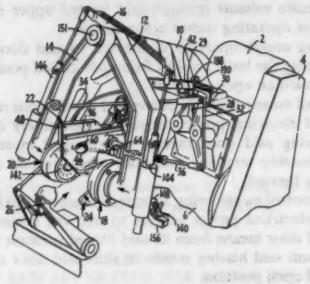
1. Apparatus for bisecting and pitting fruit of the drupe type, comprising

a pair of generally coplanar body-bisecting blades having opposed cutting edges;

means for supporting said blades to receive such a fruit and, upon said fruit being positioned between said blades with its suture generally in said plane, for moving one blade toward the other in said plane to engage said pit in either a first position in which said blades are in gripping relation to a sound pit or past said first position to a second position with at least one said blade within a split pit;

fruit gripping means disposed adjacent opposite sides of said plane and supported for movement into coaxial gripping relation with the halves of a fruit, the body of which is bisected by said blades and the pit of which is engaged by said blades, and means for so moving said gripping cups and for rotating them about their mutual axis upon the gripping engagement of a sound pit by said blades for shearing said fruit halves from said sound pit;

a generally U-shaped coring spoon mounted to one of said blades for rotation about an axis extending transverse to the legs of the U, said coring spoon being dimensioned such that rotation about said transversely extending axis will describe a body of revolution at least as large as said pit;



means responsive to the movement of said one blade to said second position for shifting said blades and said coring spoon from said second position, in which said coring spoon is remote from said pit, to a third position in which said blade cutting edges are remote from said pit and in which said coring spoon is adjacent said gripped fruit halves and extending adjacent a portion of said pit; and

coring spoon actuating means operatively connected to said coring spoon for rotating said coring spoon about said spoon axis of rotation when said blades and said coring spoon are shifted to said third position, whereby rotation of the coring spoon will cut the split pit from the fruit halves.

---

**4,213,383**

## BEAN SNIPPER

Charles G. Burton, Lewiston, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,250
Int. Cl.[2] A23N *15/04*
U.S. Cl. 99—636 18 Claims

1. A bean snipper comprising a generally horizontal annular drum having an inner and outer surface and a longitudinal axis, openings in said drum of a size to permit only the ends of the beans to protrude outwardly from said outer surface, knife means for snipping said protruding ends of said beans, means for mounting said knife means in contiguous relationship to said outer surface, orienter means in said drum for orienting

beans falling toward said openings with their longitudinal axes in a relatively transverse orientation with respect to said longitudinal axis of said drum to thereby tend to cause said ends of said beans to be more likely to be directed toward said openings, said orienter means comprising a plurality of discs located within said drum and oriented transversely to the longitudinal axis of said drum, an elongated shaft, mounting means for mounting said elongated shaft with its axis substantially parallel to and offset from said longitudinal axis of said drum, means mounting said discs in substantially parallel relationship on said shaft, first means for rotating said drum, and second means for rotating said shaft in the same direction as said drum, said discs being located proximate the downwardly moving part of said drum such that the beans are moved upwardly by said drum to be dropped through said discs.

---

**4,213,384**

## COMPACTING APPARATUS

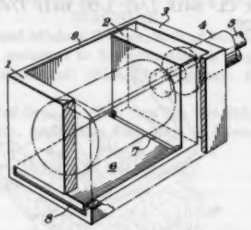
**Edward F. Telling, Worthing, England, assignor to Trewhella Bros. (UK) Ltd., United Kingdom**

**Filed Jul. 24, 1978, Ser. No. 927,531**

**Claims priority, application United Kingdom, Jul. 26, 1977, 31402/77; Oct. 14, 1977, 42925/77; Feb. 3, 1978, 4530/78; Feb. 14, 1978, 5764/78; Apr. 6, 1978, 13597/78; Apr. 18, 1978, 15102/78**

**Int. Cl.² B30B *15/08, 15/30, 9/32***

**U.S. Cl. 100—74** **14 Claims**



1. A compacting apparatus comprising
a first compacting plate;
a second compacting plate;
means for mounting said second compacting plate for reciprocating movement relative to said first compacting plate;
movement means for providing said relative movement;
means defining a free-fall aperture between said first and second plates and adjacent one of said plates; and
means for supporting material to be compacted, at least during the initial stage of a compacting operation,
said support means for supporting including a floor means extending from one of said plates and being arranged for movement beyond the other of said plates, said floor means having arranged therein said free-fall aperture such that in the full compacting position of said plate said aperture lies beneath the compacted material.

---

**4,213,385**

## SCRAP SHEARING MACHINE

**Peter Dahlem, Hilden, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik GmbH, Düseldorf, Fed. Rep. of Germany**

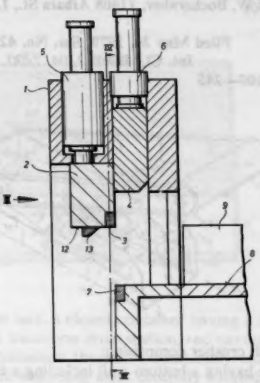
**Filed May 15, 1978, Ser. No. 905,982**

**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739825**

**Int. Cl.² B30B *9/32***

**U.S. Cl. 100—95** **5 Claims**

1. A scrap shearing machine comprising a frame, an upper knife support, means mounting said upper knife support for upward and downward movement in said frame, an upper knife fixed to said upper knife support, a stationary lower knife and means fixedly mounting said stationary lower knife in said frame for coaction with said upper knife in a shearing plane, a bending plunger, means mounting said bending plunger in said frame for upward and downward movement on the side of said upper knife remote from said lower knife, and means for moving said bending plunger, said upper knife support and said upper knife upwards and downwards in said frame to act on



scrap fed to said machine and protruding between said upper knife and said lower knife, said means for moving said bending plunger being operative to move said bending plunger downwards in advance of downward movement of said upper knife whereby said bending plunger comes into contact with said scrap before said upper knife comes into contact with said scrap.

---

**4,213,386**

## COMPACTING APPARATUS

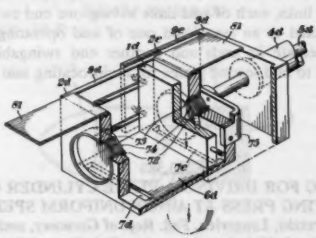
**Vera I. Telling, Worthing, England, assignor to Trewhella Bros. (UK) Ltd., Great Britain**

**Filed Jul. 24, 1978, Ser. No. 927,530**

**Claims priority, application United Kingdom, Aug. 10, 1977, 33436/77; Aug. 10, 1977, 33437/77**

**Int. Cl.² B30B *9/32***

**U.S. Cl. 100—98 R** **5 Claims**



1. A compacting apparatus in which the material to be compacted is a can or drum comprising
a first compacting plate;
a second compacting plate;
means for mounting said second compacting plate for reciprocating movement relative to said first compacting plate;
drive means coupled to at least one of said plates for providing said relative movement;
means defining a free-fall aperture between said first and second plates and adjacent one of said plates; and

means for removing an end cover of the can or drum during a compacting operation.

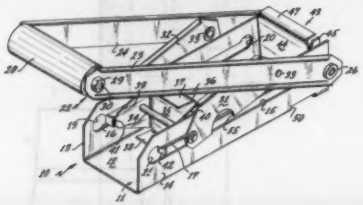
---

**4,213,387**

## CAN CRUSHER

**Carlos P. McCaney, 20119 S. Hillford, Carson, Calif. 90746, and Ronald W. Bocksruker, 11408 Albata St., Los Angeles, Calif. 90049**

**Filed May 24, 1979, Ser. No. 42,588**
**Int. Cl.[2] B30B *1/04, 7/00***
**U.S. Cl. 100—245** **10 Claims**



1. A can crusher comprising:

a frame having a bottom wall including a front edge, a rear edge and a pair of side edges, said side edges being parallel to the principal axis of said bottom wall, said frame also having an upstanding sidewall affixed to each of said side edges, an open front and an open rear, each of said sidewalls being provided with an elongated slot extending from a point adjacent said open front, said bottom wall being provided with a can discharge opening adjacent said open front;

a first platen affixed to said frame at said open front and in front of said can discharge opening;

a second platen reciprocably mounted in said slots for movement from a point adjacent said open rear to a point adjacent said first platen;

an operating handle including a pair of operating levers each having first and second ends;

a pivot pin swingably connecting one end of each of said levers to said frame adjacent said first platen;

a hand grip affixed to the other end of each of said levers; and

a pair of links, each of said links having one end swingably connected to an associated one of said operating levers intermediate its ends and another end swingably connected to said second platen for reciprocating said second platen.

---

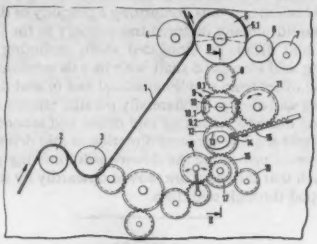
**4,213,388**

## GEARING FOR DRIVING A PLATE CYLINDER OF A PRINTING PRESS AT A NON-UNIFORM SPEED

**Helmut Geretzki, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany**

**Filed Sep. 18, 1978, Ser. No. 943,189**
**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 7729287[U]**
**Int. Cl.[2] B41F *5/00*; F16H *35/02***
**U.S. Cl. 101—216** **6 Claims**

1. Gearing for driving a plate cylinder of a printing press at a non-uniform speed, characterised in that the plate cylinder (5) is concentrically connected to a gear in mesh with an intermediate gear (8) engaging a gear (9.1) on the output shaft of differential gearing (9), that the input shaft of the differential gearing carries a gear (9.2) in mesh with a drive gear (12) on the shaft of which there is secured a cam plate (13), that a gear (11) meshing with a longitudinally guided rack (15) engages the gear (10.1) forming the second input of the differential



gearing (9), and that the rack (15) carries at one end a cam roller (14) which rolls on the cam plate (13).

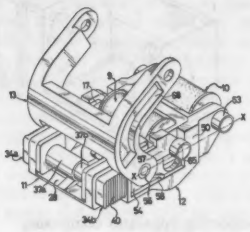
---

**4,213,389**

## INK SUPPLY DEVICE FOR HAND LABELER

**Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan**

**Filed Sep. 6, 1977, Ser. No. 830,806**
**Claims priority, application Japan, Sep. 6, 1976, 51-105836; Dec. 11, 1976, 51-148314**
**Int. Cl.[2] B41K *1/42, 5/00*; B41F *1/40***
**U.S. Cl. 101—295** **12 Claims**



1. An ink supply device for a hand labeler:

said labeler comprising: a labeler frame; an operating lever, which is movable with respect to said frame between two positions; a printing head, including type surfaces adapted to be inked and opposable to a platen; a platen opposable to said type surfaces; moving means for moving said printing head and said platen together and apart;

said ink supply device comprising: a support holder connected with said operating lever for being moved with respect to said frame past said type surfaces as said operating lever moves between its said positions;

an ink roller support frame; two ink rollers, arrayed generally parallel to each other and parallel to said type surfaces; a respective cartridge frame for each said ink roller; each said ink roller being rotatably supported on its respective said cartridge frame; said cartridge frames being, in turn, attached to said ink roller support frame;

retaining means connected to said ink roller support frame and extending to said support holder for retaining said ink roller support frame to said support holder; biasing means for normally urging said retaining means to extend to said support holder; said retaining means being movable in opposition to the urging by said biasing means, thereby to separate said retaining means from said support holder;

guide means comprising first guiding elements in said labeler frame and cooperating second guiding elements connected to said support holder near one of said ink rollers and being in engagement with said first guiding elements;

said first guiding elements extending along said labeler frame on a first pathway past said type surfaces and on a path for guiding said one ink roller on a first path over and in engagement with and past a said type surface;

said guide means further comprising third guiding elements in said labeler frame, separate from said first guiding elements, and cooperating fourth guiding elements connected to said support holder near the second of said ink rollers, said third guiding elements extending along said labeler frame on a different second pathway past said type surfaces than said first pathway, and on a path for guiding said second ink roller on a second path over and in engagement with and past a said type surface;

one said cartridge frame being pivotally attached to said ink roller support frame, thereby to be moved between a position at which said ink rollers are generally in a plane generally parallel to said type surfaces and a position where the said ink roller on said one pivotable cartridge frame is upraised and said ink rollers are thereby no longer in a plane generally parallel to said type surfaces, thereby giving access to said one ink roller cartridge frame for removal of said ink roller from its said cartridge frame.

---

**4,213,390**

## REMOTE-CONTROL ADJUSTMENT RETROFIT SYSTEM FOR AN INK SUPPLY IN A PRINTING MACHINE

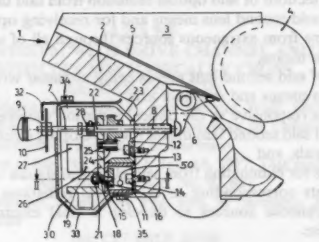
**Oskar Liebert, and Michael Wörner, both of Neusäss, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N), Augsburg, Fed. Rep. of Germany**

**Filed Sep. 21, 1978, Ser. No. 944,586**

**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 7730668[U]**

**Int. Cl.³ B41F *31/02***

**U.S. Cl. 101—365** **9 Claims**



1. Remote control retrofit adjustment system for an ink supply in a printing machine, to control the relative position of a doctor blade (5) and an ink roller (4), and in which the frame (2) of the printing machine supports a plurality of adjustment screws (7) threaded in the frame and effective against the doctor blade to adjust its position with respect to the roller, comprising, in accordance with the invention,

a plurality of supports (19), each having bearing means journalling a cylindrical portion (22) of one of the adjustment screws (7);

gear means (23) operatively connected to each adjustment screw;

an electric motor (27) secured to a respective support;

a gear train (26, 25, 24) in driving connection with the motor (27) and engageable with a respective gear means (23) of the associated adjustment screw (7);

and individually adjustable attachment means (15, 16, 17, 18, 20, 21) attaching each support (19), individually adjusted, to the frame (2).

**4,213,391**

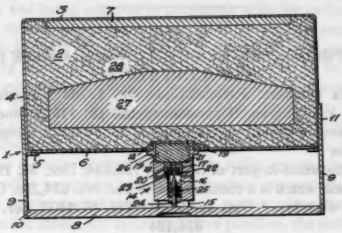
## ANTI-TANK MINE WITH PERIPHERAL CHARGE INITIATION

**Bernard E. Drimmer, Brentwood, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 7, 1953, Ser. No. 353,696**

**Int. Cl.² F42B *23/04***

**U.S. Cl. 102—8** **10 Claims**



1. In a demolition unit, a closed container having a shallow depth relative to its transverse cross section, and having a high explosive charge contained therein, a completely embedded non-explosive shock absorbing mass centrally located within said explosive and extending laterally to within a short distance of the side walls of said container, a facing plate projectile of substantial density secured to and substantially coextensive with the top wall of said container and in contact with said explosive, and means below said non-explosive mass for initiating said explosive charge, the detonation wave of said explosive charge striking said face plate as a flat wave to propel said plate intact toward a target.

---

**4,213,392**

## ELECTRICALLY IGNITABLE CARTRIDGE-LESS BULLET

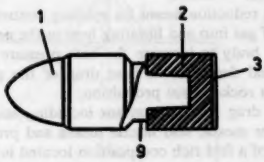
**Hubert Usel, A-6401, Inzing, Tirol, Austria**

**Continuation of Ser. No. 785,098, Apr. 6, 1977, abandoned, which is a continuation of Ser. No. 527,289, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 327,217, Jan. 26, 1973, abandoned. This application Jul. 18, 1977, Ser. No. 817,120**

**Claims priority, application Austria, Jan. 28, 1972, 679/72**

**Int. Cl.² F42B *9/00***

**U.S. Cl. 102—38 R** **16 Claims**



1. An electrically ignitable cartridge-less bullet comprising a projectile having a rearwardly extending pin-shaped projection, said projection having a rear surface and a circumferential surface; a propellant charge connected to said projectile and having an internal surface and an external surface, said internal surface engaging said rear and said circumferential surfaces of said projection of the projectile; and a multi-layer firing cap provided on said external surface of the propellant charge and including at least one ignition layer adjacent said external surface of the propellant charge, and one semiconductive layer having one surface in contact with said ignition layer, said semiconductive layer being subjected to an electrical voltage differential when the bullet is to be fired so that discrete cur-

rent paths in said semiconductive layer are rapidly heated during the passage of electric current, said multi-layer firing cap further including a second semiconductive layer having a surface in contact with a surface of said first-mentioned semiconductive layer opposite said one surface of the latter and being incapable of electrically conducting in parallelism with the plane of said second semiconductive layer so that a heating zone of very localized dimension will result during the passage of electrical current to thereby decrease the amount of electrical current for obtaining ignition.

---

**4,213,393**

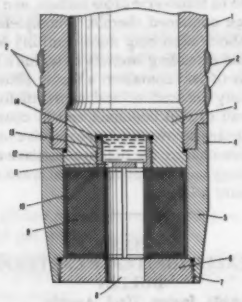
## GUN PROJECTILE ARRANGED WITH A BASE DRAG REDUCING SYSTEM

**Nils-Erik Gunners, Furudalsvägen 10, 13700 Västerhaninge; Rune V. Hellgren, Södermannagatan 18, 11623 Stockholm, and Torsten Liljergren, Sandavägen 28, 14032 Grodinge, all of Sweden**

**Continuation-in-part of Ser. No. 755,634, Dec. 30, 1976, abandoned, which is a continuation of Ser. No. 624,236, Oct. 20, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,184**

**Int. Cl.² F42B *13/20***

**U.S. Cl. 102—49.3** **3 Claims**



1. A projectile for gun launching through a muzzle and having decreased base drag characteristics comprising:

a projectile body presenting a base including restricted gas outlet nozzle means;

wall means interiorly of said projectile body defining combustion chamber means communicating with said gas outlet nozzle means;

base drag reduction means for ejecting controlled low mass flow of gas into and librating heat in the near wake zone of said body to increase the base pressure in said wake zone and decrease the base drag of the gun projectile without rocket assist propulsion;

said base drag reduction means including said combustion chamber means, said nozzle means and propellant grain means of a fuel rich composition located in said combustion chamber means and presenting a burning area operable to be ignited upon muzzle exit;

the exit area of said restricted outlet nozzle means, the burning area and mass of said propellant grain means in said combustion chamber means and the static burning rate of said propellant grain means being so related that said low mass flow of gas is operable to continue from the time of muzzle exit for a considerable portion of projectile flight, and that in flight the pressure in said combustion chamber only slightly exceeds the pressure at said base in an amount of 0.01 to 0.5 bar;

the total area of the said base ($A_b$), the area of the restricted gas outlet nozzle means ($A_n$) and the dimensionless mass flow rate of the ejected gas (I) being in the ratio

$$\frac{A_b/A_b}{I}$$

and being at least 10 at the muzzle of the gun barrel.

---

**4,213,394**

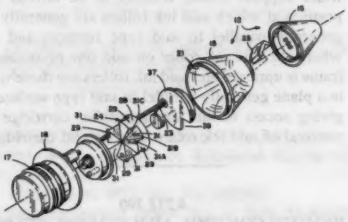
## SPIN PROCESSING ACTIVE OPTICAL FUZE

**Charles H. Brenner, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 13, 1972, Ser. No. 314,642**

**Int. Cl.² F45C *13/02***

**U.S. Cl. 102—213** **7 Claims**



1. An optical target detecting device adapted to be carried by a projectile and to rotate therewith about the projectile spin axis comprising,

a projectile nose cone,

a source of optical radiation in said nose cone,

first lens means on said nose cone for directing a beam of said radiation at an angle to said spin axis and toward a target,

a plurality of second lens means on said nose cone disposed axially rearwardly of said first lens means and disposed circumferentially with respect to each other for receiving reflections of said optical radiation from said target in one of said second lens means and for receiving optical radiations from extraneous sources through all of said second lens means,

one of said second lens means being coplanar with said first lens means and said spin axis,

means responsive to the optical radiation received said first and said second lens means for developing electrical firing signals, and

means for eliminating from said electrical signals the components corresponding to the optical radiations from said extraneous sources to develop a final electrical firing pulse.

---

**4,213,395**

## BALL ROTOR SAFETY AND ARMING DELAY DEVICE

**David S. Breed, Hillcrest Rd., Boonton Township, Morris County, N.J. 07005**

**Continuation-in-part of Ser. No. 698,806, Jun. 23, 1976, Pat. No. 4,098,192, which is a continuation-in-part of Ser. No. 470,152, May 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 288,026, Sep. 11, 1972, abandoned. This application Mar. 3, 1978, Ser. No. 883,307**

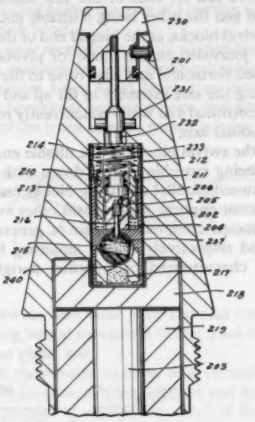
**The portion of the term of this patent subsequent to Jul. 4, 1992, has been disclaimed.**

**Int. Cl.² F42C *15/22***

**U.S. Cl. 102—236** **15 Claims**

1. A safety and arming delay fuze for spinning munitions comprising a housing, a cavity in said housing, a ball rotor in said cavity having a polar moment of inertia larger than either transverse moment of inertia, an explosive material within said ball rotor, firing means in said housing to ignite the explosive material, means to hold said ball rotor in a first safe position with said explosive material out of alignment with said firing

means and to release said ball rotor when the munition is launched, means for increasing minimum arming distance by reducing substantially all friction forces between the walls of said cavity and the ball rotor so as to minimize the effects of forces resulting from static and dynamic unbalance of the munition and consequently the variation in the total friction forces acting on the ball rotor that would otherwise result in a



wide dispersion of arming delays, such that as the munition rotates after launch, the explosive material revolves relative to the munition about the axis of the munition for many revolutions and eventually spirals into alignment with the firing means thereby providing longer minimum arming delays for the fuze with the revolving motion of the explosive material being controlled primarily by the friction forces at the point of contact of the cavity by the ball rotor.

---

**4,213,396**

## TRAFFIC SYSTEM WITH DRIVE CHANNEL AND ROAD VEHICLES MECHANICALLY CROSS GUIDED-THEREIN

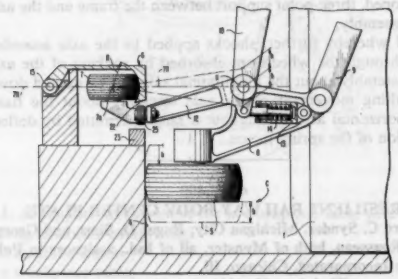
**Herbert Mehren, Ludwigsburg, and Helmut Wulf, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 806,592, Jun. 14, 1977. This application Apr. 26, 1979, Ser. No. 33,807**

**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627523**

**Int. Cl.[2] E01B *26/00***

**U.S. Cl. 104—130** **32 Claims**



**1. A traffic system which includes vehicles adapted to be driven on one of roads without tracks or in tracks, the traffic system including drive channel means for forming tracks for a track-tied operation of the vehicles, means for mechanically transversely guiding the vehicles in said drive channel means, switch guide surface means extending at least approximately vertically and pointing away from the drive channel means, the switch guide surface means is arranged substantially parallel to a respective outer side of the drive channel means within an area of one of bifurcations or mergers provided in the drive channel means, switch guide roller means arranged on both sides of the vehicles, said switch guide rollers means having an at least approximately vertical axis of rotation in an operating position and being adapted to cooperate with the switch guide surface means, and switch guide lever means for supporting the switch guide roller means at the vehicles, and means for mounting said switch guide lever means so as to be pivotal about a pivot axis disposed at least approximately parallel to a driving direction of the vehicle, characterized in that the mounting means are so arranged that the pivot axes of the switch guide lever means are at least approximately at the same height as a center of the switch guide roller means, the switch guide roller means include a roll surface cooperable with a surface of the switch guide surface means when the switch guide roller means are in an operative position, the roll surface of the switch guide roller means, as viewed in a vertical cross-section, and the surface of the guide surface means, as viewed in cross-section each have a complementary profile relative to one another so that the switch guide roller means are stabilized in a center roll-off height position during a rolling on the switch guide surface means by the complementary profiles thereof, and in that means are provided for mounting said switch guide lever means at the transversely mechanically guiding means so as to enable the switch guide roller means to execute pivotal motion relative to the transversely mechanically guiding means in a vertical plane when the guiding means is in the operating position.**

---

**4,213,397**

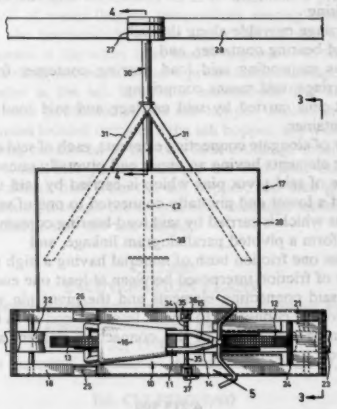
## MOTORCYCLE RAILWAY ATTACHMENT

**Roger A. Matte, Zephyr, Ontario, Canada (L0E1T0)**

**Filed Sep. 15, 1978, Ser. No. 942,543**

**Int. Cl.[2] B61D *15/00, 15/12;* B62H *1/12;* B62K *13/00***

**U.S. Cl. 105—95** **9 Claims**



**1. In combination with a bicycle having a frame with a pair of road wheels including one driven wheel and a rider's seat, a portable railroad attachment therefor comprising:**

**a trolley unit,**

**means for detachably securing the trolley unit to the bicycle frame,**

**a pair of longitudinally aligned track wheels on the trolley unit engageable with a first rail of a railroad track,**

a third track wheel on the trolley unit supported in laterally spaced relation to said pair of track wheels for engagement with the other rail,

guide means on the trolley unit for locating said driven wheel in longitudinal alignment with said pair of track wheels,

support means on the trolley unit for supporting the other road wheel of the bicycle out of engagement with said first track rail, and

pivotal support means on said trolley unit engageable with the bicycle frame at an intermediate position between said road wheels, forwardly of said rider's seat, and at an elevation to hold both said road wheels out of tractive engagement with said first rail, said pivotal support means defining a fulcrum about which the bicycle is pivoted relative to said trolley unit under the weight of a rider on said seat to bring said driven road wheel into tractional engagement with said first track rail.

---

**4,213,398**

## DAMPENED SUSPENDED CARRIER SUSPENSION

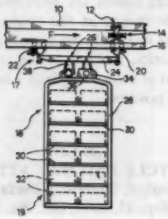
**Gaetano Di Rosa, Pino Torinese, Italy, assignor to F.A.T.A.-Fabrica Apparecchi Di Sollevamento E Trasporto Ed Affini S.p.A., Turin, Italy**

**Filed May 30, 1978, Ser. No. 910,939**

**Claims priority, application Italy, Jul. 14, 1977, 68637 A/77**

**Int. Cl.[2] B61B 5/00; B61D 15/00; B61F 5/00**

**U.S. Cl. 105—150** **4 Claims**



1. A load-carrying device for an overhead-rail conveyor, comprising:

a carriage movable along the rail,

a load-bearing container, and

means suspending said load bearing container from said carriage, said means comprising:

pivot pins carried by said carriage and said load bearing container,

a pair of elongate connecting elements, each of said connecting elements having an upper end pivotally connected to one of said pivot pins which is carried by said carriage, and a lower end pivotally connected to one of said pivot pins which is carried by said load-bearing container, so as to form a pivoted parallelogram linkage, and

at least one friction bush of material having a high coefficient of friction interposed between at least one end of one of said connecting elements and the pivot pin which is pivotally connected to said at least one end so as to brake turning movements of this connecting element about its pivot.

---

**4,213,399**

## RESILIENT UNIVERSAL LOCOMOTIVE SUSPENSION

**Eric DeBrick, Bluefield, W. Va., assignor to New River Manufacturing Company, Inc., Glen Lyn, Va.**

**Filed Oct. 10, 1978, Ser. No. 949,658**

**Int. Cl.[2] B61F 3/00, 5/16, 5/30, 5/50**

**U.S. Cl. 105—157 R** **1 Claim**

1. In a vehicle, a frame, a universal wheelset mounting, an axle assembly including an axle housing with a wheel-supporting axle rotatably journaled therein, and wheels on the axle, improved ride suspension means comprising:

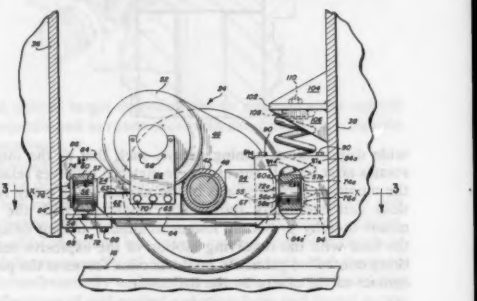
a pair of swivel blocks connected by trunnion means to fore and aft ends of the axle assembly, the trunnion means enabling rocking movement of the axle assembly about a longitudinal axis extending generally longitudinally of the direction of movement of the vehicle;

one of the fore and aft ends of the axle assembly being a hinged end and the other being a tiltable end;

one of the swivel blocks, at the hinged end of the axle assembly, being journaled on the frame for pivotal movement about a fixed horizontal axis transverse to the longitudinal axis enabling the axle assembly to tilt up and down about the fixed horizontal axis while concurrently rocking about the longitudinal axis;

the other of the swivel blocks, at the tiltable end of the axle assembly, being movable up and down with the axle assembly between parallel mounting blocks fastened to the frame adjacent opposite sides of said other swivel block;

guide track means comprising a pair of generally vertical slots formed respectively in said mounting blocks, each slot being characterized by opposed upright marginal



guide walls spaced apart in a direction parallel to said longitudinal axis;

a pair of aligned rollers extending transversely from opposite sides of said other swivel block into said slots for rolling engagement with said marginal guide walls to limit fore and aft movement of the axle assembly while enabling up and down tilting movement about said horizontal axis, and enabling rocking movement about the longitudinal axis; and

spring means acting between the frame and the tiltable end of the axle assembly on each side of the longitudinal axis urging the axle assembly downwardly;

whereby the spring means and said one swivel block at the hinged end of the axle assembly provide a stable, cushioned, three-point support between the frame and the axle assembly;

and whereby further, shocks applied to the axle assembly through the wheels are absorbed by rocking of the axle assembly about the longitudinal axis and by up and down tilting movement of the axle assembly about the fixed horizontal axis, throughout a range permitted by deflection of the spring means.

---

**4,213,400**

## RESILIENT RAILWAY BODY CENTER PLATE

**Richard C. Synder, Michigan City; Roger D. Sims, and George L. Rousseau, both of Munster, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.**

**Filed Apr. 28, 1978, Ser. No. 900,700**

**Int. Cl.[2] B61F 5/20; F16C 17/04, 27/08; F16F 1/44**

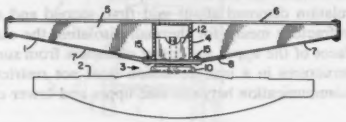
**U.S. Cl. 105—199 C** **10 Claims**

1. In a railway freight car having a truck bolster with a center bearing bowl including an upwardly generally horizon-

tal bearing portion for supporting the car body center plate of the car body bolster and an upwardly extending peripheral flange portion, an improved car body center plate structure adapted to support a body bolster comprising:

a car body base member supporting the body bolster, said base member having a laterally outward portion having a depending undersurface and a central annular flange portion extending below the outward portion toward the area of the truck bowl,

an annular wear member vertically aligned beneath said base member, said annular wear member having a top surface and a bottom truck bowl bearing surface which mates with the horizontal bearing portion and peripheral flange portion of the truck bowl to permit relative pivotal move-



ment between said wear plate and said truck bowl while preventing lateral movement of said truck bowl relative to said wear plate; and

an annular elastomeric cushion disc vertically aligned between said base and wear member and having an upper surface bonded to said undersurface of the base member and a bottom surface bonded to the top surface of the wear member and being disposed about the periphery of said annular flange portion; whereby,

vertically directed forces through the truck bowl and improved body center plate structure during rail operations are substantially dissipated by vertical reactive compression of said elastomeric disc between said vertically spaced base and wear members and swiveling movement of the truck caused by truck hunting is minimized.

---

**4,213,401**

## SUPPORT ARRANGEMENT FOR A WORKPIECE TABLE OF A GEAR TESTING MACHINE

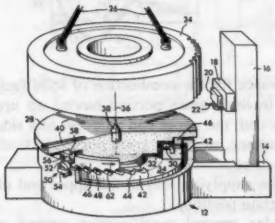
**Oskar Maag, Zürich, Switzerland, assignor to Maag Zahnräder & Maschinen Aktiengesellschaft, Zürich, Switzerland**

**Filed Nov. 6, 1978, Ser. No. 958,095**

**Claims priority, application Switzerland, Nov. 16, 1977, 13985/77**

**Int. Cl.² A47B *45/00***

**U.S. Cl. 108—20** **12 Claims**



1. A support arrangement for a workpiece table of a gear testing machine, comprising:

a machine frame;

a workpiece table;

antifriction bearing means for rotatably mounting the workpiece table at the machine frame for rotation about an essentially vertical axis;

two support rings rotatable towards one another;

said two support rings being arranged coaxially with respect to the antifriction bearing means and between the machine frame and the workpiece table;

said two support rings being provided with a number of pairs of complementary inclined surfaces which ascend opposite to the direction of rotation of the support rings towards one another and engaging said support rings with one another;

said support rings being movable, by relative rotation with respect to one another, out of a rest position where the workpiece table bears on the antifriction bearing means, into a support position where the antifriction bearing means is relieved of the load of the workpiece table.

---

**4,213,402**

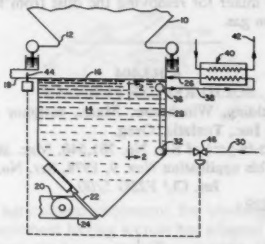
## COOLING MEANS FOR A WATER-FILLED ASH HOPPER

**Edward L. Kochey, Colebrook, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Dec. 8, 1978, Ser. No. 967,744**

**Int. Cl.² F23J *1/02***

**U.S. Cl. 110—171** **3 Claims**



1. In combination, a furnace in which coal is burned, outlet means in the bottom of the furnace through which ash is discharged, an ash hopper located beneath the outlet means, water inlet means for introducing water into the ash hopper, an overflow pipe connected to the ash hopper a predetermined height above the bottom of the ash hopper through which water is discharged therefrom, so as to maintain a predetermined level of water therein, temperature sensing means for detecting the temperature of the water in the ash hopper, control means in the water inlet means responsive to the temperature sensing means such that a predetermined temperature of the water in the ash hopper is maintained, first heat exchange means positioned in the ash hopper, second heat exchange means located outside of the ash hopper, the water inlet means being connected to the two heat exchange means such that the water first passes through the first heat exchange means to absorb heat from the ash hopper, and then gives up heat in passing through the second heat exchange means, prior to its discharge into the ash hopper.

---

**4,213,403**

## INCINERATION PLANT

**Janos Gömöri, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Uinterthur, Switzerland**

**Filed May 22, 1978, Ser. No. 908,110**

**Claims priority, application Switzerland, Mar. 7, 1978, 2441/78**

**Int. Cl.² F23G *7/00***

**U.S. Cl. 110—216** **8 Claims**

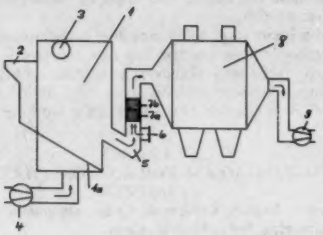
1. An incineration plant comprising

a furnace for burning a fuel while generating a flow of dust-containing combustion gases;

a combustion gas duct communicating with said furnace to exhaust the dust-containing combustion gases from said furnace;

at least one static mixer disposed in said duct to mix a flow of combustion gas passing therethrough to effect a homo-

geneous temperature distribution in the gas and a homogeneous concentration distribution of the dust in the gas, said static mixer including a plurality of guide means for dividing the gas flow into a plurality of sub-flows and for



passing the sub-flows through said mixer in criss-crossing relation to each other; and

a gas purifier communicating with said duct down-stream of said static mixer for removing the dust from the flow of combustion gas.

---

**4,213,404**

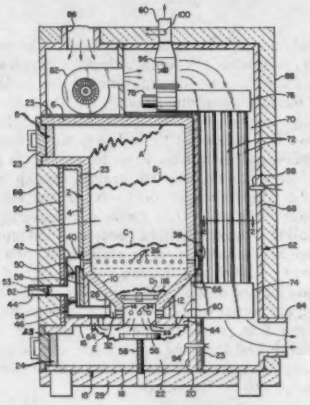
**SOLID REFUSE FURNACE**

**David B. Spaulding, Winchester, Mass., assignor to Energy Alternatives, Inc., Tualatin, Oreg.**

**Continuation-in-part of Ser. No. 781,540, Mar. 28, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,352**

**Int. Cl.[2] F23G *5/00***

**U.S. Cl. 110—229** **21 Claims**



1. A plural-chamber fire box comprising:

first refractory means having surfaces defining an upper chamber in which solid fuel may be stored, dried, gasified and partially combusted, at least a portion of said upper chamber converging in a funnel-like fashion to an opening at the bottom of said upper chamber;

second refractory means having surfaces defining a lower chamber which communicates with the upper chamber through said opening,

additional refractory means forming a structure which surrounds and contains a lower portion of the upper chamber and said opening;

means for introducing primary combustion air into the converging region of the upper chamber such that, in the presence of heat, various degrees of partial combustion may take place in said upper chamber;

means for introducing secondary combustion air at the periphery of the opening so that complete combustion of gases may take place in said opening and the lower chamber;

means located in the lower chamber below said opening for supporting (a) hot char at the bottom of the upper chamber so that the hot char serves as a gas igniter and (b) regulating the velocity and volume of total flow of air and combustion products through the firebox;

means comprising at least part of said additional refractory means defining a passageway for exiting unreacted air and hot gaseous combustion products from the lower chamber so that the heat of said unreacted air and gaseous combustion products assists in maintaining the temperature above that required for complete combustion of smoke, creosote, and other noxious emissions; and

insulation disposed about said first, second and additional refractory means for thermally isolating the outside surfaces of the upper and lower chambers from surrounding structures in a manner which does not restrict thermal communication between said upper and lower chambers.

---

**4,213,405**

**WATER-COOLED GRATE**

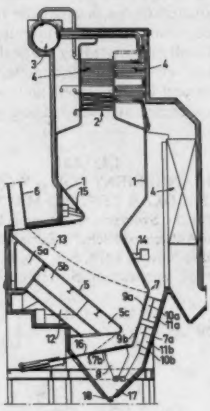
**Per-Arne Lis, and Karl A. Olausson, both of Järfälla, Sweden, assignors to Gotaverken Anteknik AB, Goteborg, Sweden**

**Filed Aug. 28, 1978, Ser. No. 937,176**

**Claims priority, application Sweden, Sep. 5, 1977, 7709940**

**Int. Cl.[2] F23G *5/00***

**U.S. Cl. 110—234** **6 Claims**



1. A furnace for the combustion of solid fuel comprising:

a first, inclined grate portion having an upper end and a lower end, the upper end adjacent to a side wall defining the furnace, said first grate portion extending outwardly below a combustion space;

means for supplying fuel to the upper end of said inclined, first grate portion;

an angular, second grate portion spaced apart from the lower end of said first grate portion and comprising a first, mainly upright part facing said first grate portion, and a second, mainly horizontal part extending backwards, below said first grate portion to receive fuel residues therefrom;

means for supplying combustion air to said first and said second grate portions; and

a passageway for conducting combustion gases from said second part of said second portion to the upper end of said first grate portion.

4,213,406

## DRAFT INTERRUPTER OF A GAS-FIRED BOILER INSTALLATION

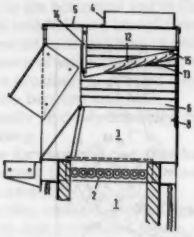
Louis H. Widdershoven, Kerkrade-West, Netherlands, assignor to Raypak Produkten B.V., Kerkrade, Netherlands

Filed Sep. 26, 1978, Ser. No. 945,908

Claims priority, application Netherlands, Oct. 5, 1977, 7710927

Int. Cl.[2] F23B 5/00

U.S. Cl. 110—326 9 Claims



1. A gas-fired boiler installation with control of the supply of combustion components, provided with a combustion space that upwardly is in communication with a flue and which is confined at the bottom side by a burner bed having atmospheric burners with interposed venturi tubes and passages for secundary air arranged between the elements of the burner bed, whereby between the combustion space and the flue there is disposed a draft interrupter, to which at the top side in the central zone thereof is connected the flue, characterised by two baffle grates, each grate extending obliquely upwardly towards and to adjacent the top end of one of two oppositely disposed sides of the draft interrupter, and the grate bars of which extend substantially parallel to said sides and, seen in cross section, extend upwardly towards the central zone of the draft interrupter.

4,213,407

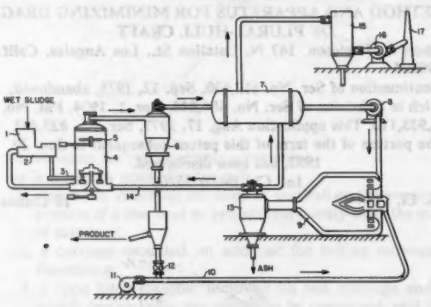
## FLASH DRYING SLUDGE DERIVED FUEL PROCESS

Kenneth N. Headley, Tonawanda, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 27, 1978, Ser. No. 973,770

Int. Cl.[2] F23G 5/04

U.S. Cl. 110—346 10 Claims




1. A process for disposing of sewage sludge comprising the steps of:

(a) introducing the sludge into a direct fired roller mill for drying, pulverizing, and classification, thereby producing a dried product and a water vapor containing exhaust gas,

(b) conveying said product from the mill by the vapor exhaust gas stream of the mill to a product collector wherein a portion of said product is removed and supplied to a furnace as fuel,

(c) superheating said vapor exhaust gas stream leaving the product collector prior to injection into said furnace by heat exchange in a vapor preheater with the furnace exhaust gases, and

(d) conducting a portion of said furnace exhaust gases to said mill for heating and drying said sludge.

4,213,408

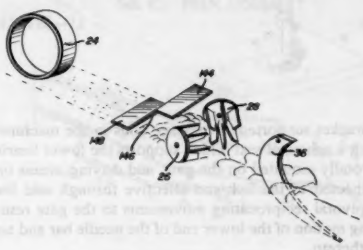
## COMBINATION RIPPER, MIXER AND PLANTER

Wilbur C. West, and James E. Atkinson, both of Pine Bluff, Ark., assignors to W. & A. Manufacturing Co., Inc., Pine Bluff, Ark.

Filed Jul. 7, 1978, Ser. No. 923,257

Int. Cl.[3] A01C 5/06; A01B 13/02

U.S. Cl. 111—85 6 Claims



1. In an agricultural implement for working and planting soil, said implement having a cross bar adapted for pulling by a prime mover, the improvement comprising, in combination, a parabolic shank trippably pivotably attached to said cross bar, a pair of mixer wheel assemblies behind and on opposite sides of the shank and adjustably and symmetrically attached to said cross bar, a press pan behind the mixer wheels and flexibly attached to said cross bar, and a parallel linkage assembly attached to said cross bar to pull in parallel spaced relationship thereto a planter bar to which planting means is attached, wherein each of said mixer wheel assemblies comprises an open center mixer wheel and adjustable mounting means, said mixer wheel comprising a circular disk and a plurality of generally axially extending planar blades welded to a face of the disk and which do not extend beyond the circumference of the disk, the disk being held at the center of the opposite face by said mounting means with the plane of said disk forming an acute angle with respect to said cross bar to aggressively mix said soil, and said blades generally paralleling and being slightly laterally offset from adjacent radial planes of said disk to facilitate the blades entering said soil and said adjustable mounting means including spring means yieldingly biasing said disks downwardly with sufficient force to enable the lower peripheral portions thereof to penetrate the soil ripped by said shank, whereby said mixer wheels pulverize and aggressively mix the ripped soil and form a small raised seed bed each blade being notched so that the outer end portions of the inner blade edges fall substantially upon the frustum of an imaginary cone opening outwardly from and centered about a line perpendicular to the center of the disk.

4,213,409

## NEEDLE BAR SUPPORT

Roger J. Ross, Mont St-Gregoire, Canada, assignor to The Singer Company, Stamford, Conn.

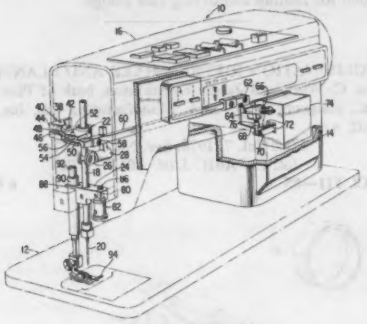
Filed Oct. 5, 1978, Ser. No. 948,851

Int. Cl.[2] D05B 3/02

U.S. Cl. 112—158 R 3 Claims

1. In a sewing machine, the combination comprising a needle bar, a needle affixed to the lower end of the needle bar, upper

and lower bearings each of which has an outer spherical surface and in which the needle bar is supported for endwise reciprocation, a fixed support including bifurcated portions on the frame of the machine, a gate having one end pivotally mounted between the bifurcated portions of the fixed support and including a spherical seat which supports the upper bear-



ing, a bracket supported at opposite ends in the machine and including a spherical seat which supports the lower bearing, a link pivotally mounted on the gate, and driving means operably connected to the link and effective through said link to impart pivotal reciprocating movements to the gate resulting in zig-zag motion of the lower end of the needle bar and needle affixed thereto.

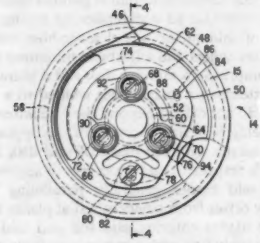
---

**4,213,410**

## ADJUSTABLE HOOK FOR A SEWING MACHINE

**Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Mar. 9, 1979, Ser. No. 19,068**
**Int. Cl.[2] D05B *57/14***
**U.S. Cl. 112—228** **2 Claims**



1. In combination, a sewing machine hook including an adjustable hook body with a beak for seizing a loop of needle thread and a bottom flange with a central opening therein, a shaft which extends through the opening, a pair of clamping plates axially and radially restrained on the shaft, the plates being disposed in sliding contact with opposite sides of the hook body flange bottom to permit radial and circumferential adjustments of the hook body relative to the shaft axis when unclamped, and means for tightly clamping the plates to the hook body flange and shaft for affixing the hook body and beak in an adjusted position with respect to the shaft axis, the means for clamping the plates to the hook body flange including a fastener to secure the hook body and hook beak in a radially adjusted position, and other fasteners to establish a positive driving connection between the hook body and shaft, one of the plates having a pin thereon, and the hook body flange including parallel elongated slots which receive the pin and said first mentioned fastener to guide radial adjusting movements of the hook body.

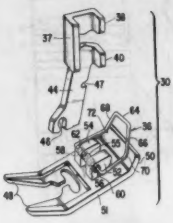
---

**4,213,411**

## READILY ATTACHABLE AND DETACHABLE SOLE PLATE FOR A SEWING MACHINE

**Warren D. Knowles, Clark, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Jul. 30, 1979, Ser. No. 62,213**
**Int. Cl.[3] D05B *29/12***
**U.S. Cl. 112—240** **6 Claims**



1. A presser device for a sewing machine having a presser bar thereon, said presser device comprising a shank which detachably connects with the presser bar and has both a notch in the rear edge thereof and a slot at the bottom end; a sole plate including a toe end portion, a heel end portion, a work engaging portion therebetween, and a hinge pin mounted on the work engaging portion; a latching spring of resilient wire for attaching the sole plate to said shank, the spring including spaced apart side portions, a cross piece at one end interconnecting the spaced apart side portions, and aligned fingers at the opposite end substantially parallel to the cross piece, the fingers being pivotally connected to the sole plate, said side portions of the spring including a bend which forms knees engageably by the rear end portion of the sole plate for causing the cross piece to be snapped into said notch at the rear edge of the shank while the hinge pin on the sole plate is held up in the slot in the bottom of the shank, and the sole plate to be thereby attached to the shank, the hinge pin being movable out of said slot by pivotal movement of the sole plate on the knees whereupon the cross piece of the spring may be removed from the notch in the shank and the sole plate detached therefrom.

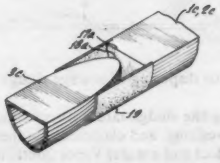
---

**4,213,412**

## METHOD AND APPARATUS FOR MINIMIZING DRAG OF PLURAL-HULL CRAFT

**Robert S. Jamieson, 147 N. Catalina St., Los Angeles, Calif. 90004**

**Continuation of Ser. No. 612,630, Sep. 12, 1975, abandoned, which is a division of Ser. No. 456,846, Apr. 1, 1974, Pat. No. 3,933,110. This application Aug. 17, 1977, Ser. No. 825,441**
**The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.**
**Int. Cl.[2] B63B *35/00***
**U.S. Cl. 114—61** **15 Claims**



1. A method of minimizing water drag of longitudinally

aligned buoyant hulls without the use of flaps, filler elements or extra fairings, comprising the following steps:

(a) making the stern of a forward hull and the bow of an after hull of generally complementary conjugate shape, whereby there may be a close fit between said stern and bow even when there is some relative vertical and horizontal motion between the aligned hulls, thereby streamlining the flow of water in the region of adjacency of said hulls, and

(b) rotating said forward and after hulls in parallel unison, such that the longitudinal axes of said hulls are maintained mutually parallel during rotation, through substantially equal angles in the horizontal and in the same direction of rotation until said hulls are brought into substantial longitudinal alignment with said bow of said after hull in close proximity astern of said forward hull, whereby said alignment in close proximity is effected without relative longitudinal motion between said hulls.

4. A substantially hydrodynamically continuous buoyant structure comprising:

(a) at least one forward and one after hull, said hulls being fitted with strong hull attachment means,

(b) propulsion means,

(c) interconnecting means connected to said hull attachment means and to said propulsion means, whereby said hulls may be caused to be simultaneously rotated into substantial longitudinal alignment in close proximity wherein said interconnecting means cause the longitudinal axes of said hulls to be mutually parallel during rotation, and also whereby said hulls may be caused to be propelled in unison, and

(d) means for streamlining the contours of said forward hull into said after hull,

said streamlining means being capable of allowing substantial relative lateral motion between said hulls when said hulls are in close proximity.

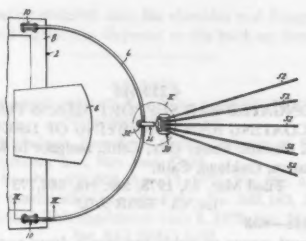
---

**4,213,413**

## WATER SKI TOW ASSEMBLY

**Albert L. Courtney, Rte. #2, Lamar, Mo. 64759**

**Filed May 17, 1978, Ser. No. 907,025**
**Int. Cl.[2] B63B *21/56***
**U.S. Cl. 114—253** **2 Claims**



1. A water ski tow assembly comprising:

a. a generally semi-circular rail,

b. means for attaching the ends of said rail to the rearward portion of a tow boat to project rearwardly from the stern of said boat,

c. a carriage mounted on said rail for rolling movement therealong,

d. a rope hitch member mounted on said carriage and to which one end of a tow rope may be connected, said tow rope having an enlargement affixed to the end thereof to be attached to said hitch member, and said hitch member comprising a flat plate having an aperture formed therethrough, said aperture being elongated in a direction generally radial to said rail, the end portion of said aperture closest to said rail being sufficiently wide to pass said rope and said rope enlargement therethrough, and the end portion thereof remote from said rail being sufficiently narrow to admit said rope but not said enlargement, and

e. a locking device consisting of a lock plate having at least one elongated slot, and a fastener engaged in said slot and said hitch plate for movably mounting said locking device on said hitch plate, said locking device being manually movable between positions in which it respectively does and does not overlie the wider end portion of said hitch plate aperture.

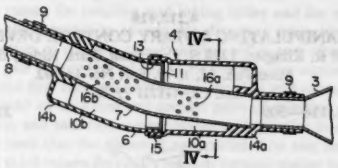
---

**4,213,414**

## ENGINE EXHAUST MEANS FOR MOTOR PROPELLED BOATS

**Masato Sato, Akashi, and Takemi Inoue, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan**

**Filed Jan. 4, 1978, Ser. No. 866,910**
**Claims priority, application Japan, Jan. 13, 1977, 52-3602[U]**
**Int. Cl.[2] F01N *1/00***
**U.S. Cl. 115—73** **1 Claim**




1. Motor-propelled boat comprising a boat hull, internal combustion engine means mounted on said boat hull through resilient mounting means and adapted to drive propulsion means, said engine means including body means and exhaust means connected with said body means, said exhaust means including exhaust pipe means rigidly connected at one end with the engine body means and at the other end with an expansion chamber means, noise attenuating means which includes a housing means having one end connected to the expansion chamber means and perforated pipe means disposed in said housing means and being supported by the housing means, said perforated pipe means being in communication with said expansion chamber means and having perforations so that resonance chamber means is formed between the housing means and the pipe means, said noise attenuating housing means including a first and second housing means, said first housing means being constructed entirely of resilient rubber material and connected at one end with said expansion chamber means such that engine vibrations transmitted through the exhaust pipe means are absorbed thereby and at the other end with said second housing means, the other end of said second housing means being connected with outlet pipe means, said noise attenuating means further including partition wall means located at a position where the first and second housing means are connected together, said partition wall means extending radially between the housing means and the perforated pipe means to define a plurality of resonance chamber means.

---

**4,213,415**

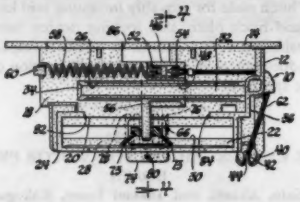
## ANTIRATTLE STRUCTURE FOR A TRANSMISSION RATIO INDICATOR ASSEMBLY

**Thomas F. Coha, Flint, and Marvin L. Owen, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 30, 1979, Ser. No. 34,598**
**Int. Cl.[2] G01D *11/10*; G09F *9/40***
**U.S. Cl. 116—28.1** **1 Claim**

1. An improvement in transmission ratio indicators having a slide member guided in a housing for linear movement by the

operator and a follower member driven by the slide member and being constrained in a slot in the housing for selective movement within a constant radius recess, wherein the improvement comprises; a pair of outwardly extending spring



arms formed integrally with said follower and slidably contacting the housing in the constant radius recess external to the slot to preload the follower to one side of the slot and to prevent the follower from vibrating in the slot.

---

**4,213,416**

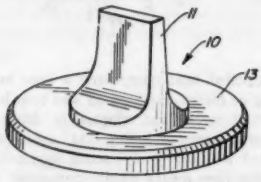
**MANIPULATING ROTARY CONTROL DEVICE**

**Michael R. Klingler, 1238 S. Courtland, Park Ridge, Ill. 60068**

**Filed Feb. 12, 1979, Ser. No. 11,202**

**Int. Cl.[2] G12B *11/02***

**U.S. Cl. 116—309** **21 Claims**



1. A manipulating rotary control device comprising:

a dial having a peripheral portion;

a hub located inwardly of said dial peripheral portion and defining a socket arranged for selective removable coaxial mounting thereof onto a control shaft end, said dial and hub being arranged to provide access to said socket from one facial side of said dial;

a hollow manipulating knob formed of a thermal insulation, light transmitting material and having a connecting portion connected to said dial for effecting rotation of said dial as a result of manual rotation of said knob about the axis of rotation of said socket, the inner surface of the knob being provided with a reflective coating; and

means for interconnecting said knob and said hub for rotating about said socket about the axis thereof as an incident of said manual rotation of said knob, said knob including a portion covering said hub at the opposite facial side of the dial.

---

**4,213,417**

**APPARATUS FOR APPLYING LIQUID COATING TO FOOD PRODUCTS**

**James R. Ellis, Cypress, Calif., assignor to LeRoy Enterprises, Inc., Los Alamitos, Calif.**

**Filed Sep. 19, 1978, Ser. No. 943,675**

**Int. Cl.[2] B05C *3/10***

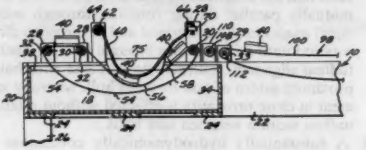
**U.S. Cl. 118—30** **3 Claims**

1. Apparatus for applying a liquid coating to food products, said apparatus comprising:

a transversely extending container for liquid material;

a continuous dipper chain extending across the width of said container, operative to travel in a generally longitudinal direction, and characterized by a multiplicity of interstices, said dipper chain dipping down into said container to define a submerged run and rising out of said container to define a drip run, said chain further including carrier means for engaging and carrying products placed upon said dipper chain through said submerged run and said drip run;

restraining means including a continuous sheet of material extending across the width of said container, fixed in



position during normal operation and located above said submerged run of said dipper chain, said sheet of material constituting a squeegee and pressure plate operative upon the tops of products placed upon said dipper chain and moving through said submerged run to control the thickness of said liquid material upon said products and to prevent rising of products buoyant in said liquid material; and

drive means for operating said dipper chain.

---

**4,213,418**

**ENLONGATED BAR SUPPORT MEANS FOR THE SPRAY COATING AND CONVEYING OF DRUM PARTS**

**Donald E. Oswald, Foster City, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.**

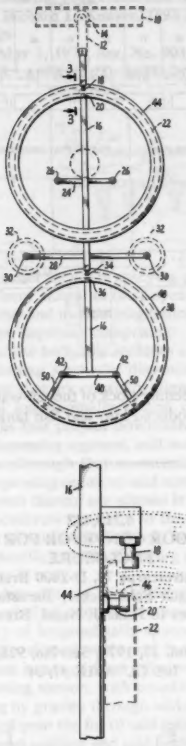
**Filed Mar. 13, 1978, Ser. No. 885,773**

**Int. Cl.[2] B05B *5/02***

**U.S. Cl. 118—635** **2 Claims**

1. Support means to stably position a drum end, having a peripheral axial shoulder and radial flange, vertically for the application thereto of a coating material comprising an elongated bar and means to dispose the bar in a vertical position, hanger means carried by the bar to receive and retain the peripheral edge of the drum end, a cross-member carried by the bar below said hanger means, magnet means carried by the cross-member to engage the drum end and in conjunction with said hanger means stationarily position the drum end in a generally vertical plane for the application thereto of coating material, an annular back-up member for said drum end secured to said bar, said member being positioned substantially concentrically with respect to a drum end positioned on such support means and having an outer diameter greater than the diameter of the drum end and an inner diameter less than the peripheral shoulder of the drum end, all of said parts being formed of electrical conductor material and being connected

to ground, whereby said back-up member functions as an over-spray shield to prevent the deposition of electrostatically



charged coating material onto the shoulder and flange area of the drum end adjacently disposed to the back-up member.

---

**4,213,419**

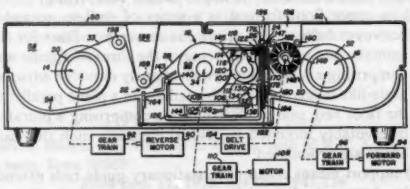
## APPARATUS FOR CLEANING AND RE-INKING PRINTER RIBBONS

**Albert N. Nicholson, San Jose, Calif., assignor to Computer Ribbon Systems, Inc., San Jose, Calif.**

**Division of Ser. No. 676,504, Apr. 13, 1976, Pat. No. 4,088,800, which is a continuation-in-part of Ser. No. 648,182, Jan. 12, 1976, abandoned. This application May 8, 1978, Ser. No. 904,020**

**Int. Cl.[2] B05C *1/08***

**U.S. Cl. 118—670** **12 Claims**



1. An apparatus for cleaning and re-inking a printer ribbon carried on first and second reels and having foreign matter thereon comprising:

a frame;

a first pair of rotatable spindles mounted in said frame so as to define a first axis and capable of holding the first reel;

a second pair of rotatable spindles mounted in said frame so as to define a second axis parallel to said first axis, said second pair of spindles being capable of holding the second reel;

first means for rotatably driving said first and second pairs of spindles in a preselected angular direction to cause the printer ribbon to unwind from one of said reels and wind onto the other of said reels;

an elongated inking roller rotatably mounted in said frame between and parallel to said first and second axes for contacting and applying ink to the printer ribbon;

a metering roller rotatably mounted in said frame parallel to said inking roller for metering ink onto said inking roller;

a trough disposed beneath said inking roller for containing ink and providing such ink to said inking roller;

second means for supplying ink to said trough;

third means rotatably mounted in said frame intermediate said second pair of rotatable spindles and said metering roller for contacting, forcibly removing the foreign matter from and opening the fibers of the ribbon;

fourth means for rotating said inking roller and for rotating said third means in an angular direction opposite to the direction of rotation of said inking roller and of said second pair of spindles when the ribbon is being accumulated on said first reel, whereby when the first and second reels are held by said first and second pairs of spindles, respectively, and said first means drives said spindles in a direction such that the ribbon is accumulated on said first reel, said third means forcibly removes foreign matter from the ribbon and serves to clean and to open the fibers of the ribbon, and whereby continued rotation causes said inking roller to contact and apply ink to the cleaned ribbon, the ink serving to penetrate into the opened fibers of the ribbon;

sensing means for sensing holes in the ribbon as it moves from one reel to the other and including

a source of light positioned adjacent the path of one surface of the moving ribbon such that a beam of light from the source is directed against said one surface, and

light detector means positioned adjacent the opposite surface of the moving ribbon so that any holes in the ribbon allow light from the source to reach said detector; and

fifth means for stopping the rotation of said spindles when the light detector senses light passing through a hole in the ribbon.

---

**4,213,420**

## APPARATUS FOR PROCESSING A PARTICULATING PRINTING PLATE

**Peter V. Martino, 9960 65th Rd., Rego Park, N.Y. 11374**

**Filed Aug. 9, 1978, Ser. No. 932,370**

**Int. Cl.[2] G03D *5/04*; B05C *5/00***

**U.S. Cl. 118—713** **24 Claims**

1. An apparatus for processing a particulating printing plate having an image carrying coating on one face thereof in a horizontal, continuous, through-put manner comprising:

an outer casing having an entrance end and an exit end, and a pair of opposed side portions, one of said side portions being disposed at an upward tilt relative to the other side portion;

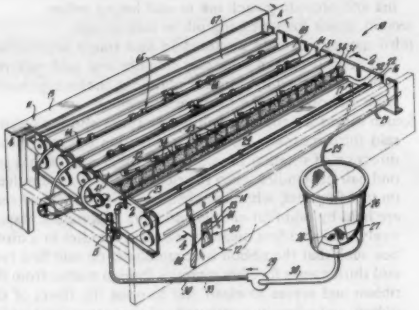
a pair of rotatable entry rollers disposed one above the other in nip contact adjacent the entrance end of the outer casing for receiving the plate and conveying it in a horizontal direction;

first spray means disposed adjacent the downstream end of said entry rollers for laterally spraying developer solution onto the image carrying surface of the plate as the plate leaves said entry rollers;

first and second rotatable brush rollers for removing unwanted coating on said plate, said brush rollers being

disposed in nip contact with one another adjacent said first spray means, said first brush roller being in contact with the particulating image carrying coating on said one face of the particulating printing plate, said first brush roller including a spiral squeege member disposed below the outer surface of the pile of said first brush roller, which squeege member functions to provide a screwing effect for removing said developer solution and the particulate off the plate in the direction of said lateral flow of developer solution;

second spray means disposed adjacent the downstream end of said brush rollers for spraying developer solution onto the image carrying surface of the plate after the plate leaves the nip of said first and second brush rollers;



a first pair of squeege rollers disposed adjacent said second spray means, one above the other to form a nip for receiving the plate, removing excess solution from the plate and transporting the plate in a horizontal direction towards the exit end of the outer casing;

means for rotating said entry rollers and said squeege rollers at substantially the same speed in the direction of travel of the plate;

means for individually rotating said first brush roller in a direction opposite to that of the travel of the plate, and at a speed greater than that of said entry rollers; and

means for rotating said second brush roller in a direction opposite to that of said first brush roller and at a slower speed than that of said first brush roller.

---

**4,213,421**

## METHOD OF AN INSTALLATION FOR BREEDING SEA-WATER CREATURES IN TANKS

**K. H. Droese, Weisenhü ttenstr. 17, 6000 Frankfurt am Main and Jürgen Flüehter, Am Gasteig 3, 8121 Pähl, both of Fed. Rep. of Germany**

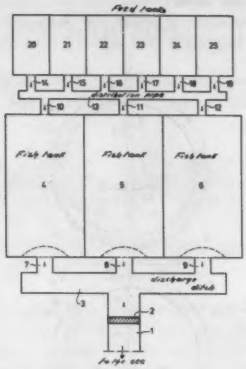
**Filed Sep. 28, 1977, Ser. No. 837,109**

**Claims priority, application South Africa, Oct. 4, 1976, 76/5924**

**Int. Cl.[2] A01K *61/00***

**U.S. Cl. 119—3** **14 Claims**

6. An installation for breeding sea-water creatures in tanks, which includes in combination: feed tanks for receiving and growing algae and planktons, first conduit means establishing fluid communication between said feed tanks and a source of sea-water for conveying sea water to said feed tanks, seaside fish tanks, second conduit means for selectively conveying planktons from said feed tanks into said fish tanks, said feed tanks being located inland at a higher level than said fish tanks, and a hatchery including container means for receiving and



accommodating breeding stock of the sea-water creatures to be bred and to be introduced into said fish tanks therewith.

---

**4,213,422**

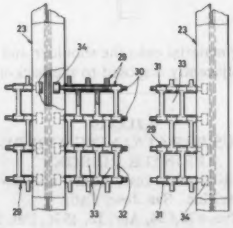
## GRATED FLOOR CONVEYOR FOR POULTRY ENCLOSURE

**Hans J. Nagel, Contrescarpe 72, D-2800 Bremen, Fed. Rep. of Germany, and Egon Schumacher, Barnstorf, Fed. Rep. of Germany, assignors to Hans J. Nagel, Bremen, Fed. Rep. of Germany**

**Filed Jul. 27, 1978, Ser. No. 928,497**

**Int. Cl.[2] A01K *31/04***

**U.S. Cl. 119—21** **9 Claims**



1. In a housing enclosure for the breeding and fattening of poultry or the like and including means for feeding and watering the poultry and an upper floor for the poultry spaced above an underlying floor bed, the improvement comprising:

(a) an upper floor formed as a series of endless, rotatable conveyor belts whose upper run serves as a floor for the animals, said upper floor being in the form of a grate and comprising a plurality of synchronously movable adjacent grate-like bands located substantially in a plane parallel to the floor bed, said grate-like bands comprising a plurality of pivotably mounted individual elements such that said bands are articulated;

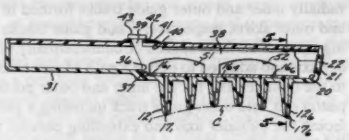
(b) support means comprising stationary guide rails extending between adjacent bands, said guide rails having an upper covering; and

(c) a catching grate provided on the upper floor which is movable together with said upper floor for preventing the poultry from leaving the floor.

## 4,213,423
## POWDER DISPENSER

Henry A. Bryan, 8142 Ridgefield Dr., Huntington Beach, Calif. 92646; Walter H. Martin, 9902 Cleverdale Ave., Westminster, Calif. 92683, and Richard L. Konves, 1193 Dorset La., Costa Mesa, Calif. 92626

Filed May 1, 1978, Ser. No. 901,463
Int. Cl.³ A01K 13/00; A45D 24/22
U.S. Cl. 119—86 3 Claims



1. A powder dispenser for use in applying powder by gravity onto the skin of a furry animal as the dispenser is transversely disposed to the animal and moved longitudinally relative to the animal, said powder dispenser comprising:

a. an elongate hollow body that includes a top and a bottom, said body including a powder dispensing segment and a handle segment that are coaxially aligned;

b. a plurality of longitudinally spaced conical nozzles of varying lengths that project downwardly from said bottom of said dispensing segment, said nozzles having bores extending therethrough that communicate with the interior of said dispensing segment, said nozzles of such length that the free ends thereof are aligned in an arcuate configuration that conforms generally to the transverse convex configuration of said animal's back, both said dispensing segment and handle capable of having said powder stored therein;

c. an elongate plate situated in said dispensing segment and slidably supported on said bottom thereof, said plate having a plurality of longitudinally spaced openings therein that are axially aligned with said bores in said nozzles when said plate is moved from a first to a second position in said dispensing section, with powder in said dispensing section falling by gravity through said openings and bores to be dispensed onto the fur of said animal when said plate is in said second position and said body is moved longitudinally relative to the body of said animal;

d. articulating means connected to said plate and extending to the exterior of said body for moving said plate to either said first or second position, said openings and bores being out of communication when said plate is in said first position, and said powder being maintained within said body, said articulating means including:

1. an elongate spline secured to said plate and extending upwardly therefrom;

2. a tab secured to said spline, said tab extending upwardly through an elongate slot in said top; and

3. sealing means operatively associated with said tab and slot to prevent powder being discharged from the interior of said body through said slot;

e. a cover removably secured to said dispensing section of said body, said cover when mounted on said dispensing section forming a part of said top, and said cover when removed allowing the interior of said hollow body to be filled with said powder.

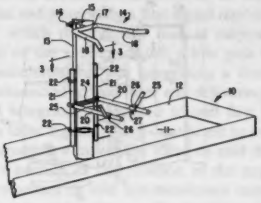
---

## 4,213,424
## SMALL ANIMAL HOLDER

Carl A. Hosch, and Michael L. Hosch, both of R.R. 2, Parkersburg, Iowa 50665

Filed Sep. 11, 1978, Ser. No. 941,124
Int. Cl.² A01K 29/00
U.S. Cl. 119—98 8 Claims

1. A holder for a small animal comprising a base, support means mounted on said base and extending upwardly therefrom, yoke means adapted to receive the neck of said animal mounted on said support means and vertically spaced from said base whereby said animal can be suspended in said yoke means, arm means pivotally mounted on said support means between said yoke means and said base, said arm means being thereby



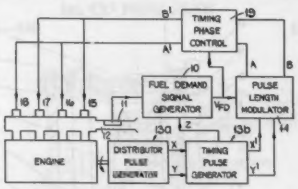
adapted to engage the sides of said animal to hold the animal steady in said yoke with said arm means being swingable so that the space between them is variable to provide for varying sizes of animals, and with said arms being biased toward each other.

---

## 4,213,425
## INTERNAL COMBUSTION ENGINE FUEL INJECTION CONTROL

Martin A. Read, Redditch, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 7, 1977, Ser. No. 831,311
Claims priority, application United Kingdom, Sep. 21, 1976, 39026/76
Int. Cl.² F02M 51/00; F02B 3/00
U.S. Cl. 123—478 5 Claims




1. An internal combustion engine fuel injection control comprising means for generating an electrical fuel demand signal varying in accordance with at least one engine parameter, at least one injector for injecting fuel into the engine, means for generating electrical pulses for operating said injector, pulse length modulation means for modulating the duration of said pulses and having a modulating input connected to receive said fuel demand signal, whereby the quantity of fuel injected at each operation of the injector is determined by said fuel demand signal, and means synchronising the injector operation with the engine operating cycle and including phase varying means sensitive to the fuel demand signal for varying the timing of commencement of injection in accordance with the fuel demand signal.

---

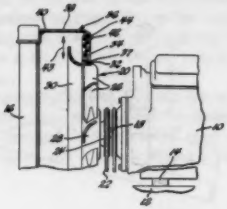
## 4,213,426
## SHROUDING FOR ENGINE MOUNTED COOLING FAN

Richard E. Longhouse, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1978, Ser. No. 959,432
Int. Cl.² F01P 7/10; F04D 29/40
U.S. Cl. 123—41.49 2 Claims

1. For use with a vehicular engine and radiator, an engine cooling system comprising a fan including a plurality of blades and rotatably mounted on said engine intermediate said engine and said radiator, a rotating shroud secured to the outer tips of

said blades and defining an outer periphery, a stationary shroud assembly including a mounting portion attached to said radiator, and a flexible shroud portion extending from said mounting portion into close proximity to a predetermined annular



portion of said outer periphery of said rotating shroud, the distal end of said flexible shroud portion being adapted to being intermittently contacted by the adjacent rotating surface of said rotating shroud for temporary deflection of said flexible shroud portion upon dynamic movement of said fan.

---

**4,213,427**

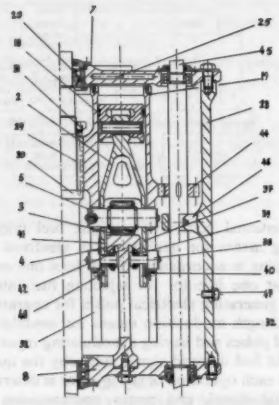
## ROTARY ENGINE

**Alfonso Di Stefano, 1413 Wayburn, Grosse Pointe Park, Mich. 48236**

**Continuation of Ser. No. 757,826, Jan. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 617,696, Sep. 29, 1975, abandoned. This application Jun. 16, 1978, Ser. No. 915,982**

**Int. Cl.[2] F02B *57/00***

**U.S. Cl. 123—43 AA** **17 Claims**



1. In a rotary internal combustion engine having an output shaft, a cylinder block including at least one cylinder, a housing in which the output shaft and the cylinder block are rotatably mounted with the axis of the cylinder extending parallel to and spaced radially from the axis of rotation of the cylinder block, means for drivingly connecting the cylinder block to the output shaft, a piston reciprocably mounted in the cylinder, a rod connected to the piston, cam means engageable by the rod for defining reciprocating movements of the piston and converting said movements into rotary motion of the cylinder block, said cam means comprising an annular cam member carried by the housing in concentric relation to the axis of rotation of the cylinder block and having axially opposed cam surfaces formed on a T-shaped free end in symmetrical relation with respect to the circular plane defined by rotation of the cylinder axis about the axis of rotation of the cylinder block, and guide means on the cylinder block for defining movement of the piston rod relative to the cam means, the improvement wherein:

the piston rod is provided with radially inner and outer separate portions straddling said free end of the cam member;

the cylinder block includes radially inner and outer skirts respectively positioned adjacent to said inner and outer portions of the piston rod, said guide means comprising radially inner and outer guide tracks formed in said inner and outer skirts, respectively, said guide tracks each having a pair of surfaces spaced circumferentially of the cylinder axis and adapted to define a path of movement parallel to the cylinder axis for the inner and outer portions of the piston rod, said outer guide track including a guide surface facing the cylinder axis and extending parallel thereto;

anti-friction roller means are carried by said inner and outer portions of the piston rod for engaging said guide track surfaces and maintaining said piston rod portions in axially and radially defined relation to said cam means;

a drive roller is mounted on an axle carried by said inner and outer piston rod portions and engageable with a drive cam surface on said cam means and facing the cylinder; and

radially inner and outer retaining rollers are carried by axles on said inner and outer rod portions, respectively, each of said retaining rollers being engageable with one of a pair of retaining cam surfaces on said cam means and facing oppositely from the cylinder.

---

**4,213,428**

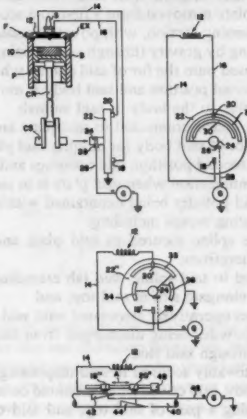
## ELECTROMAGNETIC AUGMENTATION OF INTERNAL COMBUSTION ENGINES

**Phecell Bradley, 214 E. Genesee, Flint, Mich. 48505**

**Filed Feb. 22, 1977, Ser. No. 770,751**

**Int. Cl.[2] F02B *71/00***

**U.S. Cl. 123—46 E** **5 Claims**



1. In an internal combustion engine having a paramagnetic engine block, including a paramagnetic engine head, and a paramagnetic piston slidably mounted within a cylinder of said paramagnetic engine block for movement within said cylinder in response to cyclic combustion of fuel within said engine;

said engine being operably connected to a generating system;

said generating system comprising generating means operably connected to said engine and to battery storage means;

wherein the improvement comprises:

a permanent magnet fixedly mounted within said paramagnetic piston, with the axis of magnetic polarity of said

permanent magnet being disposed parallel to the direction of movement of said paramagnetic piston;

electromagnetic coil means fixedly mounted in said paramagnetic engine head for selectively generating a magnetic field for interacting with the magnetic field of said permanent magnet;

first means connecting said electromagnetic coil means to said generating system, said first means being synchronized with the movement of said paramagnetic piston, so that said electromagnetic coil means exerts an attracting force, at least intermittently, upon said permanent magnet when said permanent magnet is approaching said electromagnetic coil means, and said electromagnetic coil means exerts a repelling force, at least intermittently, upon said permanent magnet when said permanent magnet is moving away from said electromagnetic coil means;

said paramagnetic piston has a plural stroke cycle, wherein at least a portion of a first stroke is a compression stroke, and at least a portion of a second stroke is a power stroke; and

said first means connects said electromagnetic coil means to said generating system so that said electromagnetic coil means exerts an attracting force upon said permanent magnet only during a predetermined portion of said compression stroke, and exerts a repelling force upon said permanent magnet only during a predetermined portion of said power stroke.

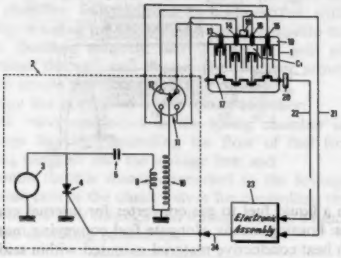
---

**4,213,429**

## METHOD AND DEVICE FOR AUTOMATICALLY ADJUSTING THE SPARK ADVANCE OF A CONTROLLED IGNITION ENGINE

**Andre Douaud, Puteaux, and Joseph Rialan, Meudon, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Sep. 25, 1978, Ser. No. 945,711**
**Claims priority, application France, Sep. 26, 1977, 7729105**
**Int. Cl.² F02P *5/04***
**U.S. Cl. 123—414** **6 Claims**




1. A method for automatically adjusting the ignition timing of a controlled ignition engine to the optimum value of this timing corresponding to the maximum output and efficiency of the engine, wherein the ignition timing is so adjusted that the pressure peak in at least one cylinder occurs at a predetermined angular position of the drive shaft of the engine, this method comprising:

determining the angular position of the drive shaft,

detecting the accelerations at a location on the cylinder head of the engine and providing, during at least a selected fraction of the rotation of the drive shaft and in a low frequency band, a first signal corresponding to these accelerations,

integrating said first signal to obtain a second signal,

integrating the second signal to obtain a third signal from which may be determined the maximum value thereof with respect to the angular position of the drive shaft, and

adjusting the ignition timing as a function of the angular position of the drive shaft corresponding to the maximum value of said third signal.

5. A device for automatically adjusting the ignition timing of an engine, comprising ignition control means, and a detector of the angular rotation of the engine drive shaft, wherein the device comprises an accelerometer secured to the cylinder head of the engine and generating a first signal representing the accelerations to which the cylinder head is subjected at the point of location of the accelerometer, a low pass filter connected to said accelerometer and generating a first signal, a first integrator connected to said filter and delivering a second signal, a second integrator connected to said first integrator and delivering a third signal, means connected to said second integrator for detecting a maximum value of said third signal during at least a portion of the rotation of the engine drive shaft, means, connected to said last-mentioned means and to said detector, for detecting the angular position of the drive shaft corresponding to said maxmimum value, comparing means connected to said detecting means for measuring the difference between said measured angular position and a reference angular position, and adjusting means, connected to said comparing means, for adjusting said control means as a function of said difference.

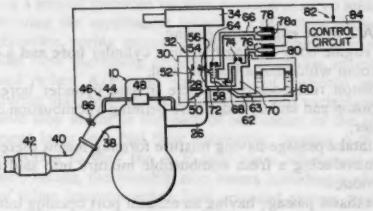
---

**4,213,430**

## SPARK-IGNITION INTERNAL COMBUSTION ENGINE CAPABLE OF REDUCING NOXIOUS CONSTITUENTS IN EXHAUST GASES

**Hidehiro Minami, Yokohama, and Teruo Aoki, Hachiohji, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Continuation of Ser. No. 672,405, Mar. 31, 1976, abandoned. This application Aug. 8, 1978, Ser. No. 931,984**
**Claims priority, application Japan, Apr. 1, 1975, 50/40143**
**Int. Cl.² F02M *25/06***
**U.S. Cl. 123—440** **18 Claims**




1. A spark-ignition internal combustion engine having a cylinder in which a combustion chamber is defined by a cylinder head and a piston crown, comprising:

air-fuel mixture supply means for supplying an air-fuel mixture induced into the combustion chamber, said air-fuel mixture supply means being communicated through an intake passage with the combustion chamber and having a throttle valve;

exhaust gas recirculating means for recirculating a portion of exhaust gases with the induced air-fuel mixture into the combustion chamber, said exhaust gas recirculating means including conduit means which connects an exhaust passage of the engine with the intake passage downstream of the throttle valve

a plurality of spark plugs disposed within the combustion chamber for reliably igniting the air-fuel mixture containing the recirculated exhaust gases;

a three-way catalytic converter communicable through the exhaust passage with the combustion chamber to purify the noxious constituents in the exhaust gases discharged from the combustion chamber, said three-way catalytic converter being designed to reduce nitrogen oxides and

oxidize carbon monoxide and hydrocarbons in the exhaust gases; and

air-fuel ratio control means for controlling air-fuel ratio of the air-fuel mixture supplied into the combustion chamber at stoichiometric value so as to accomplish effective purification of noxious constituents in said three-way catalytic converter,

whereby the emission levels of nitrogen oxides, carbon monoxide and hydrocarbons in the exhaust gases are considerably decreased improving fuel consumption.

---

**4,213,431**

## 2-CYCLE ENGINE OF AN ACTIVE THERMOATMOSPHERE COMBUSTION TYPE

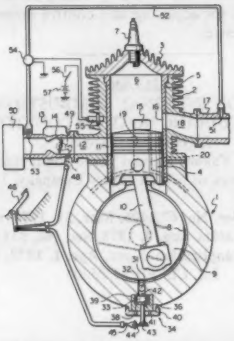
**Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jan. 26, 1979, Ser. No. 6,897**

**Claims priority, application Japan, Feb. 9, 1978, 53-12942**

**Int. Cl.[2] F02M *75/06***

**U.S. Cl. 123—73 R** **22 Claims**



1. A 2-cycle engine comprising:

an engine body having therein a cylinder bore and a crank room which has a bottom wall;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder bore defining a combustion chamber;

an intake passage having mixture forming means therein for introducing a fresh combustible mixture into said crank room;

an exhaust passage having an exhaust port opening into said combustion chamber for discharging exhaust gas into the atmosphere;

transfer passage means communicating said crank room with an inlet port opening into said combustion chamber for leading the fresh combustible mixture into said combustion chamber from said crank room;

restricting means arranged in said transfer passage means at a position near said combustion chamber for restricting the cross-section of said transfer passage means; and

means for recirculating the exhaust gas into said intake passage from said exhaust passage.

---

**4,213,432**

## DEVICE FOR VAPORIZING LIQUID HYDROCARBON FUEL

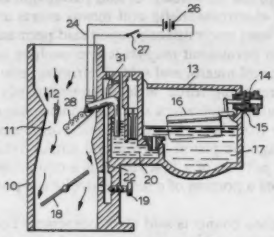
**Dudley D. Levy, 590 Laconia Ave., Lake Worth, Fla. 33463**

**Filed Apr. 2, 1979, Ser. No. 26,226**

**Int. Cl.[2] F02M *31/00***

**U.S. Cl. 123—549** **4 Claims**

1. A device for vaporizing liquid hydrocarbon fuel as it enters a downwardly flowing stream of flowing oxygen-containing gas, comprising a reservoir for a vaporization liquid hydrocarbon fuel, a fuel feed tube extending upwardly out of said reservoir and then laterally, means for conducting a stream of oxygen-containing gas downwardly past the end of said feed tube for drawing fuel through said fuel feed tube, a corrugated heater plate mounted on the end of said feed tube and projecting from the end of the feed tube into the stream of gas and an electric resistance heater in said plate and having a heating capacity for heating the amount of fuel flowing



through said fuel feed tube to supply the latent heat of vaporization thereto and heat the fuel to a temperature between a temperature about halfway between the temperature of vaporization and the temperature at which the vaporized fuel becomes explosive in the oxygen-containing gas, whereby the fuel is instantaneously and completely vaporized upon coming in contact with said corrugated plate.

---

**4,213,433**

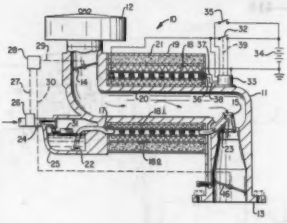
## LIQUID FUEL TO GAS CONVERTER FOR ENGINES

**John C. Day, 2316 Stafford La., Mesquite, Tex. 75150**

**Filed Oct. 31, 1977, Ser. No. 846,774**

**Int. Cl.[2] F02M *31/00***

**U.S. Cl. 123—549** **12 Claims**



1. In a liquid fuel to gas converter for internal combustion engines: housing means; elongate fuel conveying means made of high heat conductive material mounted within said housing means; said elongate fuel conveying means having a fuel inlet end constructed for liquid fuel input from liquid supply means, and an outlet end positioned for delivery of molecular gaseous state fuel to engine fuel intake means; a heating system with heating element means mounted within said housing means to heat said elongate fuel conveying means sufficiently to ensure substantially complete transformation of fuel from the liquid state to the molecular gasified state as fuel is passed through said elongate fuel conveying means after initial warmup; wherein said elongate fuel conveying means is tubular element means formed primarily as coil means contained in foreshortened form within said housing in an efficiently packaged structure; with said heating system means in close contiguous relation to said coil means for optmized heat transfer to and through said coil means to the fuel being passed through the tubular element means formed into said coil means; wherein said heating system means is in concentric relation with said coil means; said heating system means includes an electric resistance element means formed into a cylindrical structure in

close contiguous relation to said coil means; and wherein an air intake passage structure is provided with an air passage for feeding intake air to an internal combustion engine; and wherein a portion of said air passage is through, and surrounded by said heating system means and said coil means for heat transfer to intake air prior to admission of fuel in the heated molecular gasified state.

---

**4,213,434**

## FUEL INJECTION SYSTEM

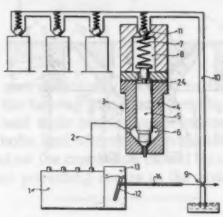
**Hans-Jörg Vogtmann, Markgröningen, and Gerhard Stumpp, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Oct. 18, 1978, Ser. No. 952,353**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801976**

**Int. Cl.[2] F02M *9/00*; B05B *1/30***

**U.S. Cl. 123—462** **4 Claims**



1. A fuel injection system comprising:

a fuel pump which generates an injection pressure;

at least two fuel injection nozzles connected to the fuel pump, each of said fuel injection nozzles including: a spring chamber; a pressure chamber to which fuel is delivered under injection pressure by the fuel pump; a connecting chamber extending between and communicating with the pressure chamber and the spring chamber; a valve needle mounted within the pressure chamber and connecting chamber; and a closing spring mounted within the spring chamber for biasing the valve needle into the pressure chamber, wherein fuel flows from said pressure chamber through said connecting chamber around said valve needle and into said spring chamber;

a leakage line connected to the spring chamber;

a check valve connected to the spring chamber and the leakage line for controlling the flow of fuel from the spring chamber into the leakage line; and

a common throttle means connected to the leakage lines downstream of the check valves for controlling the pressure in and flow through said leakage lines as a function of engine operating parameters.

---

**4,213,435**

## AIR/FUEL RATIO REGULATOR

**Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

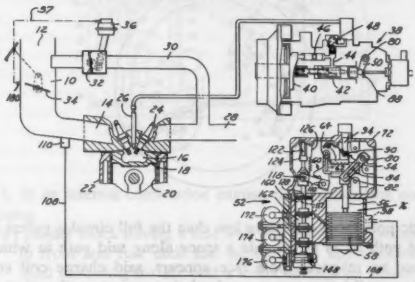
**Filed Aug. 29, 1978, Ser. No. 937,695**

**Int. Cl.[3] F02D *1/06*; F02M *7/00***

**U.S. Cl. 123—446** **7 Claims**

1. An air/fuel ratio regulator for use with the fuel injection control system of an internal combustion engine of the spark ignition type having an air and exhaust gas (gas) induction passage open at one end to air at ambient pressure level and connected at its other end to the engine combustion chamber to be subject to manifold vacuum changes therein, a throttle valve rotatably mounted for movement across the passage to control the gas flow therethrough, exhaust gas recirculation (EGR) passage means connecting engine exhaust gases to the induction passage above the closed position of the throttle valve, an EGR flow control valve mounted in the EGR passage means for movement between open and closed positions to control the volume of EGR gas flow, an engine speed responsive positive displacement type fuel injection pump having a fuel flow output to the engine that varies in direct proportion to changes in engine speed to match fuel flow and mass air flow through the induction system of the engine over the entire speed and load range of the engine to maintain the intake mixture ratio of air to fuel constant, the pump having a fuel flow control lever movable to vary the fuel rate of flow, the regulator being characterized by

engine manifold vacuum responsive first servo means operably connected to the fuel control lever for maintaining a constant air/fuel (A/F) ratio by changing fuel flow output as a function of changing manifold vacuum and air flow upon opening of the throttle valve, a fuel enrichment control lever operably connected to the pump control lever and movable to modify the position of the pump



lever dictated by the first servo means to change the A/F ratio, and further means responsive to engine operating conditions for moving the fuel enrichment control lever to provide the changed A/F ratio, the further means including a second manifold vacuum responsive servo means for moving the enrichment lever in a fuel flow decreasing direction, spring means biasing the enrichment lever in a fuel flow increasing direction for maximum enrichment and richest A/F ratio upon decay of manifold vacuum during maximum engine acceleration, and variably adjustable stop means in the path of movement of the enrichment lever in a fuel flow decreasing, leaning A/F ratio direction to vary the A/F ratio upon adjustment of the stop means, the variable stop means including a plurality of inline interconnected fluid actuated pistons relatively movable with respect to each other for varying the linear distance between pistons.

---

**4,213,436**

## CAPACITOR DISCHARGE IGNITION AND ALTERNATOR AUXILIARY POWER SYSTEM

**Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.**

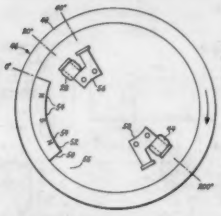
**Continuation of Ser. No. 771,019, Feb. 22, 1977, abandoned. This application Sep. 13, 1978, Ser. No. 941,985**

**Int. Cl.[2] F02P *1/00*; H02K *21/22***

**U.S. Cl. 123—599** **8 Claims**

1. In a capacitor discharge ignition and alternator auxiliary power system having a capacitor, a triggered electronic switch element responsive to trigger voltage pulses for discharging said capacitor, and a spark plug which fires in response to discharging of said capacitor, a generator for producing charge voltage pulses for charging said capacitor, for producing trigger voltage pulses for triggering said switch element, and for producing auxiliary power voltage pulses for an auxiliary power output, said generator including a stator means carrying a charge coil connected in charging relationship with said capacitor, a trigger coil connected in triggering relation-

ship with said switch element, and at least one auxiliary power coil, a rotor providing an array of at least three magnetic pole faces in regularly spaced relation to one another along a circular path along which they move as said rotor rotates, said magnetic pole faces being of alternating magnetic polarity along said path, said charge coil being located adjacent said circular path so that each time said magnetic pole face array passes it, it has induced in it a series of repetitive charge pulses, said trigger coil being located adjacent said circular path so that each time said magnetic pole face array passes it, it has induced in it a series of repetitive trigger pulses which repetitively trigger said electronic switch, and said auxiliary power coil being located adjacent said circular path so that each time said magnetic pole face array passes it, it has induced in it a series of repetitive auxiliary power pulses, said array of mag-



netic pole faces extending less than the full circular extent of said path so as to provide a space along said path in which space no magnetic pole face appears, said charge coil and trigger coil being so arranged relative to one another that as said space during rotation of said rotor passes said trigger coil (thereby establishing a period during which no trigger pulses are induced in said trigger coil) at least a portion of said array passes said charge coil and produces at least one charge pulse which charges said capacitor whereby the charge so stored in said capacitor is subsequently discharged to fire said spark plug by the first trigger pulse of the series of repetitive trigger pulses produced when said array next passes said trigger coil and whereby further trigger pulses of said next series of repetitive trigger pulses occur while said capacitor is in a discharged state and do not cause firing of said spark plug.

---

**4,213,437**

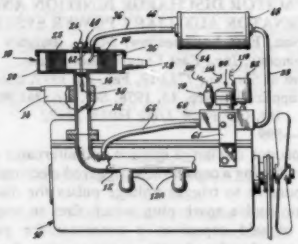
## AIR-FILTER PURGER FOR INTERNAL COMBUSTION ENGINES

**Carmen Onofrio, 300 Hemlock Dr., Orange, Conn. 06477**

**Filed Nov. 20, 1978, Ser. No. 961,860**

**Int. Cl.[2] B01D *46/04;* F02B *77/00***

**U.S. Cl. 123—179 A** **7 Claims**



1. For use with an internal combustion engine having an air filter for the air-intake system of said engine and a starting system therefor, a device for facilitating restarting said engine, comprising

blower means connected to said air filter for purging said air filter, and

control means for activating said blower means when said starting system is actuated in order to restart said engine, and for de-activating said blower means after said engine has started.

---

**4,213,438**

## PISTON FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY DIESEL ENGINES

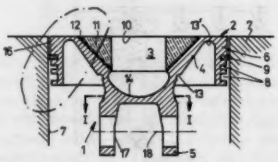
**Ludwig Elsbett, and Günter Elsbett, both of Industriestrasse 14, D8543 Hilpoltstein, Fed. Rep. of Germany**

**Continuation of Ser. No. 731,533, Oct. 12, 1976, abandoned. This application Jun. 28, 1978, Ser. No. 920,055**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545588**

**Int. Cl.[2] F02F *3/02***

**U.S. Cl. 123—668** **6 Claims**



1. A piston for an internal combustion engine comprising in combination a piston head with a combustion chamber having a bottom wall and an opening in the top opposite said bottom wall, said piston head having an annular section spaced radially outwardly of said combustion chamber with peripheral grooves for receiving piston rings, said piston also including a foot portion integral with said bottom wall of said combustion chamber, a mantle surrounding said combustion chamber and integral with and interconnecting said annular section and said bottom wall of said combustion chamber and extending from said opening to said bottom wall of said combustion chamber, thermal insulation additionally provided as an annular insert between said mantle and said combustion chamber and extending from said opening to said bottom wall of said combustion chamber and forming the wall of said combustion chamber between said bottom wall and the opening in the top of said piston head and insulating said mantle from the heat of combustion in said chamber, a radial, integral portion connecting said mantle to said annular section of less thickness than said mantle to restrict the transfer of heat from said mantle to said annular section, and an integral portion connecting said bottom wall to said mantle of less thickness than said mantle to restrict the transfer of heat from said bottom wall to said mantle, so that said mantle is shielded from the heat of combustion to limit transfer of heat of combustion to said annular section, said annular section decreasing in diameter from said piston ring to the plane of said opening and when heated said annular section substantially approaching the diameter of the cylinder in a region between said piston ring and the top end of said piston.

---

**4,213,439**

## INTERNAL COMBUSTION ENGINE

**Gerhard Feichtinger; Othmar Skatsche, both of Graz, Austria, and Hans List, 126,Heinrichstrasse, Graz, Austria, assignors to Hans List, Graz, Austria**

**Filed Nov. 16, 1978, Ser. No. 961,412**

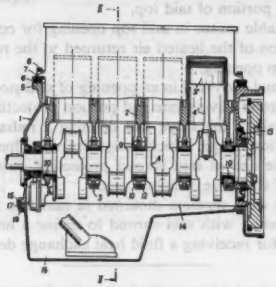
**Claims priority, application Austria, Nov. 22, 1977, 8367/77**

**Int. Cl.[2] F16M *1/02***

**U.S. Cl. 123—195 S** **5 Claims**

1. An internal combustion engine comprising an engine unit support which contains the engine parts directly affected by body resonance and sound vibration, namely cylinderhead,

cylinder, piston, connecting rod, crankshaft main bearings, and crankshaft, and a crankcase cast integral with the flywheel housing and connected to the engine unit support on flanges located above the crankshaft, the crankshaft main bearings each consisting of a bearing block and a bearing cap forming a



main bearing unit detachably secured to the engine unit support wherein the bearing blocks and bearing caps are connectable to form said main bearing units independently from the main bearing bolts, and wherein the crankcase is provided with an aperture below the crankshaft closed by at least one detachable cover part providing access to the main bearing bolts.

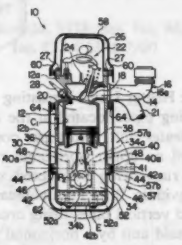
---

**4,213,440**

## LOW-NOISE-LEVEL RECIPROCATING PISTON ENGINE

**Fumiyuki Abe; Yoshimasa Hayashi, both of Yokohama, and Akira Kimura, Kawasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Nov. 22, 1978, Ser. No. 962,920**
**Claims priority, application Japan, Nov. 26, 1977, 52/142432**
**Int. Cl.[2] F02F 7/00**
**U.S. Cl. 123—195 C** **19 Claims**



1. A reciprocating piston internal combustion engine comprising:

an engine block including a cylinder block portion in which engine cylinders are formed, and a cylinder head portion to close one ends of the cylinder to define combustion chambers between it and the crowns of pistons reciprocally disposed in the cylinders, respectively, said engine block being formed with first bearing carrying portions which carry a group of upper generally semi-cylindrical parts of main bearings for supporting the journal of a crankshaft mechanically connected to the pistons; and

a bearing support block sealingly secured to said engine block and formed with a cavity to be filled with an engine lubricating oil for operating the engine so that said bearing support block serves as an oil pan, said bearing support block being formed with second bearing carrying portions which carry a group of lower generally semi-cylindrical parts of the main bearings, each lower generally semi-cylindrical part constituting a generally cylindrical main bearing in cooperation with each upper generally semi-cylindrical part.

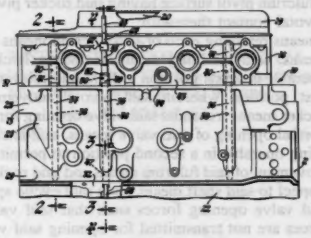
---

**4,213,441**

## ENGINE WITH WALL RIB OIL GAUGE MOUNTING AND DRAIN MEANS

**Nshan Hamparian, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 16, 1978, Ser. No. 951,499**
**Int. Cl.[2] F01M 1/00**
**U.S. Cl. 123—196 R** **8 Claims**



1. In an internal combustion engine, the combination comprising

a cylinder block having a side wall extending longitudinally to front and rear ends and including an upper cylinder head mounting surface and a lower surface on which an oil pan is mounted, defining with said block an enclosed lower chamber

an upstanding rib-like boss on said wall disposed longitudinally intermediate said ends and extending at least part way between said upper and lower surfaces, and

an internal passage within said boss and said wall, extending through said upper surface and opening from the wall into said lower chamber,

said boss and passage defining a lightened stiffening rib for reducing vibration of and resulting noise transmission from said wall as well as means for access to said lower chamber through said side wall.

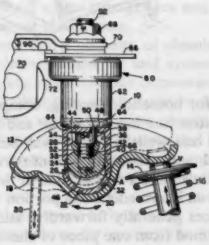
---

**4,213,442**

## VALVE SELECTOR FOR SHAFT-MOUNTED ROCKERS

**William T. Mihalic, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 29, 1977, Ser. No. 811,420**
**Int. Cl.[2] F02D 13/06**
**U.S. Cl. 123—198 F** **11 Claims**



1. A device for selectively disabling and enabling, while running, the combustion chamber valves of an internal combustion engine of the type having valve gear operative to cyclically apply forces to the valves for effecting opening

thereof and means for biasing the valve closed upon cyclic relaxation of said forces, said device comprising:

(a) shaft means adapted for attachment to the engine;

(b) rocker means associated with each of said valves, said rocker means being pivotally received on said shaft means, with each of said rocker means defining a rocker pivot surface and a driven surface adapted to receive said valve opening forces thereagainst and a driving surface adapted for contacting associated components of said valve gear for transmitting said valve opening forces thereto;

(c) fulcrum means associated with each of said rocker means, said fulcrum means being movable with respect to said shaft means, said fulcrum means including means defining a fulcrum pivot surface having said rocker pivot surface in pivotal contact therewith;

(d) means retaining each of said fulcrum means to said shaft means, said retaining means including latchable means operable in a first position to hold said fulcrum means in a first position wherein said pivotal movement of said rocker means transmits said valve opening forces to effect normal opening of said valve means, said latchable means being operable in a second position to permit lost motion movement of said fulcrum means and said rocker arm with respect to said shaft means upon said cyclic application of said valve opening forces such that said valve opening forces are not transmitted for opening said valve means; said latchable means being operable to move between said first and second positions only upon relaxation of said valve opening forces;

(e) means for mounting said shaft means on said engine; and,

(f) means selectively operable to apply and hold an actuating force on said latchable means for effecting movement between said first and second positions upon relaxation of said valve gear forces.

---

**4,213,443**

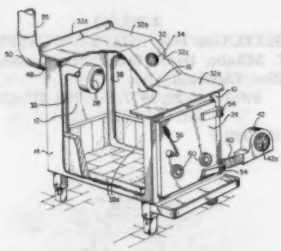
## STOVE CONSTRUCTION

**James A. Morande, Jr., Glastonbury, Conn., assignor to All Nighter Stove Works, Inc., Glastonbury, Conn.**

**Continuation-in-part of Ser. No. 798,263, May 18, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 886,283**

**Int. Cl.[2] F24C** *1/14, 15/08, 13/00*

**U.S. Cl. 126—72** **29 Claims**



1. A stove for household heating, comprising:

(a) a stove structure having a floor and side walls including front and rear walls, said rear wall being higher than said front wall, and a top with a front portion at the height of said front wall and a rear portion at the height of said rear wall, and an intermediate top portion which is sloped and which faces generally forwardly, said top portions integrally formed from one piece of sheet steel,

(b) an access door for closing an opening in said front wall,

(c) air inlet valve means mounted in said door for admitting combustion air to the interior of said stove structure,

(d) at least one conduit inside said stove structure including an open end lower portion for receiving room air outside of said stove structure and an upper portion having a forward end communicating with an opening in said sloped top portion,

(e) means for introducing room air into the open end of said lower portion so that this air is heated in the stove structure and returned to the room through said opening in said sloped portion of said top,

(f) adjustable means in said top opening for controlling the direction of the heated air returned to the room through said top opening,

(g) a shroud provided in an opening of said stove rear wall, said shroud having one end portion projecting inside the rear wall of the stove and defining a radially inwardly projecting flange, which flange defines a flue opening, an opposite end of said shroud projecting outside the rear wall of the stove structure, and

(h) a flue duct segment mounted in said flue opening and cooperating with said shroud to define a heat exchange cavity for receiving a fluid heat exchange device.

---

**4,213,444**

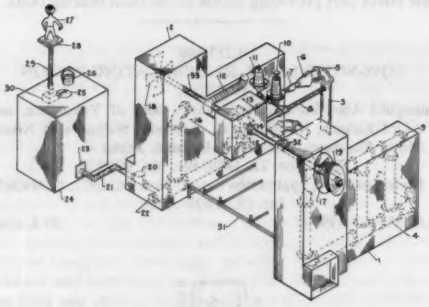
## FIREPLACE HEATER UNIT

**James J. Gardner, 210 Sherman Ave., Lancaster, Ohio 43130**

**Filed Apr. 10, 1978, Ser. No. 895,233**

**Int. Cl.[2] F24B** *13/02*

**U.S. Cl. 126—130** **4 Claims**



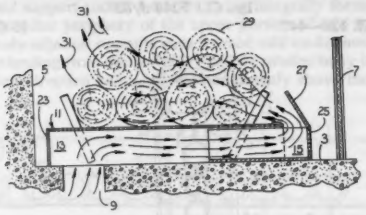
1. A "Fireplace Heater Unit" consisting of the combination of water conducting pipes located at the right and left hand side of the said heater unit, said pipes consisting of a lower horizontal run and an upper horizontal run said lower and upper horizontal runs being connected with a plurality of vertical pipes providing flow communication therebetween, said horizontal and vertical pipes being cross-connected at the lower rear of the said unit by a horizontal pipe run providing water flow communication between the said left and right hand side of said unit, a vertical pipe in communication with said horizontal cross-connect pipe at the rear of said unit whereby steam generation may be transferred to a pressure regulator, an upper horizontal cross-connect pipe run providing steam flow communication between said right and left hand side of said unit, a horizontal cross-connect pipe run with a safety valve disposed therein providing steam flow communication between said upper horizontal steam cross-connect pipe and said vertical steam generation pipe whereby said safety valve is in communication with all pressure points of said unit, shrouds or heater boxes enclosing said vertical and horizontal pipe runs located at the right and left hand side of the said unit, said shrouds or heater boxes having an opening at the lower portion thereof for cold air entry and an opening near the upper portion thereof for hot air discharge, said heater boxes having a closure whereby cold air must circulate there through and a removable grate providing means on which suitable fireplace fuel may be burned.

**4,213,445**

## FIREPLACE COMBUSTION AIR DUCT APPARATUS

**Carlos Mayo, Springdale, Ark., assignor to C. Mayo, Inc., Springdale, Ark.**

**Filed Aug. 14, 1978, Ser. No. 933,662**
**Int. Cl.² F24B *13/02***
**U.S. Cl. 126—143** **12 Claims**



1. Fireplace combustion air duct apparatus having front, rear top, bottom and side portions comprising

a pair of ducts formed of rigid material, one of said ducts telescoping within the other,

a first of said pair of ducts being closed on the top, two sides and the rear and having an opening in the bottom adapted to be placed over a fireplace ash clean-out and receive outside air therethrough,

the second one of said ducts being closed on two sides and the front having an opening at the frontward top portion, and

said second duct having an air deflector adjacent said opening for causing air to be deflected rearwardly from said opening.

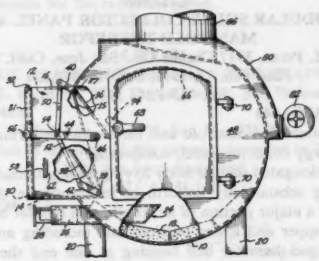
---

**4,213,446**

## STOVE DOOR OPERATOR

**Gary K. Stookey, 5000 Foots Creek Rd., Gold Hill, Oreg. 97526, and James F. Jackson, 9711 W. Evans Creek Rd., Rouge River, Oreg. 97537**

**Filed Nov. 24, 1978, Ser. No. 963,400**
**Int. Cl.² F23M *7/00***
**U.S. Cl. 126—192** **1 Claim**



1. A stove, comprising

metallic wall means forming a fire box, said wall means having outlet means for the products of combustion from said fire box;

means forming a non-conductive liner for at least the bottom portion of said fire box

said fire box having an elongated front opening defined by a horizontally disposed hearth means, an overhanging lip parallel thereto, and upright end walls, all projecting forwardly of said fire box;

an upper and a lower closable door pivot-mounted at said front opening to pivot about parallel horizontal axes between open and closed positions;

common ends of said upper and lower pivot-mounts outwardly extending through a common end wall of said fire box;

a crank arm secured external of said fire box to said outwardly extending pivot mounts;

a manually operable actuator lever pivotally mounted on said fire box end wall between said crank arms; and

a pair of links mutually connected at common ends to said lever and at each opposite end to a crank arm whereby operation of said lever either disposes said doors in a parallel open position or swings said doors to substantial alignment to close said front opening.

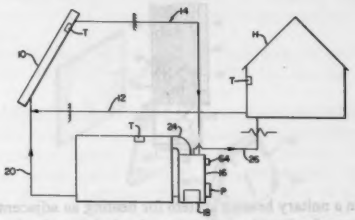
---

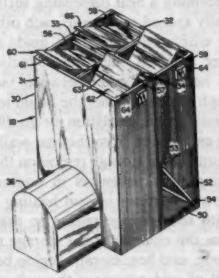
**4,213,447**

## AIR DISTRIBUTION CONTROL SYSTEM

**Donald P. Erickson, 6443 Reed Ct., Denver, Colo. 80003**

**Filed Jun. 2, 1978, Ser. No. 911,798**
**Int. Cl.² F24J *3/02***
**U.S. Cl. 126—429** **14 Claims**





1. An air distribution control system adaptable for use in a solar heating installation and the like, wherein there is provided a source of hot air, a heat storage area and a space to be heated, the improvement comprising:

a plenum partitioned into a plurality of chambers,

common air circulating means for said system mounted in said plenum having a positive side communicating with at least one of said chambers and a negative side communicating with at least one of the other of said chambers,

first and second ducts extending between said hot air source and said heat storage area, respectively, and the negative side of said chamber in said plenum, and a third duct extending between the positive side of said chamber in said plenum and the space to be heated,

temperature sensing means for sensing the temperature of said heat storage area, hot air source and the space to be heated; and

damper control means associated with said plenum to control the circulation of air between said heat storage area, hot air source and space to be heated in accordance with

the relative temperature levels sensed by said temperature sensing means.

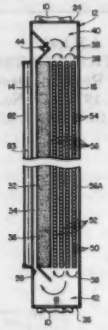
---

4,213,448

## THERMOSIPHON SOLAR SPACE HEATING SYSTEM WITH PHASE CHANGE MATERIALS

Raymond T. Hebert, P.O. Box 134, Saratoga, Calif. 95070

Filed Aug. 24, 1978, Ser. No. 936,375
Int. Cl.² F24J 3/02
U.S. Cl. 126—434 21 Claims



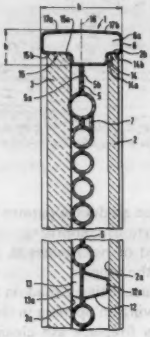
1. In a unitary heating system for heating an adjacent area, a heat transfer liquid, a container for holding the liquid and having a front wall forming a solar heat collection surface and a rear wall forming a heat dispensing surface, said walls being in substantially spaced relation to each other to define an interior volume within said container, guide means is disposed in the container adjacent the heat collection surface to form therewith a heating channel between said surface and said means through which channel the liquid to be heated flows by thermosiphonic action, insulation means disposed adjacent said guide means and spaced from the rear wall of said container to define and form a heat storage region on the other side thereof, means forming flow pathways in communication with the upper and lower portions of said heating channel to connect the same with said storage region so that heated liquid can circulate from the channel to the storage means and return in a closed system, said heat storage region being in contact with the rear wall of said container through which heat is to be dispensed to the adjacent area outside of said container and in thermal contact therewith, means for predominantly vertically orienting said heating channel and heat storage region with the upper, outlet end of the heating channel disposed above the lower, inlet end of the heating channel to cause thermosiphonic flow between the same whenever the heating channel is at a higher temperature, at least one panel containing phase change materials located in the storage region and constructed with a plurality of fully enclosed horizontal channels therethrough in spaced relation to each other, a phase change material disposed in each of said channels, said phase change material selected to change from a solid to a liquid at a predetermined threshold temperature rise, said panel defining the enclosure means for the phase change material being so constructed and arranged as to exclude physical contact between said heat transfer liquid and said phase change material but to permit thermal exchange therebetween, and control means disposed in the flow path of the collection channel for preventing reverse thermosiphoning when the collection channel temperature is cooler than a predetermined temperature equal to or greater than phase change temperature.

4,213,449

## SOLAR COLLECTOR

Manfred Roth, Dautphetal-Mornshausen, and Juergen Dreier, Dautphetal, both of Fed. Rep. of Germany, assignors to Roth Werke GmbH, Dautphetal, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 889,032
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712387
Int. Cl.² F24J 3/02
U.S. Cl. 126—447 10 Claims



1. In a solar collector for collecting the radiant heat energy of the sun and for transmitting this heat to a liquid heat carrier, comprising a pipeline system which has at least one supply port and one discharge port for conducting the heat carrier and a glazing which permits heat radiation to pass therethrough, which pipeline system is part of a platelike blow-molded absorber plate of plastic, in which adjacent pipes are formed by and separated from one another by thermoplastically welded mash seams of abutting plastic sheets, the improvement comprising a hollow frame which is made in one piece with the blow-molded absorber plate and forms the edge of the blow-molded absorber plate, said frame having a closed cross section, said hollow frame having on its upper side a fluted mortise for receiving the edge of said glazing.

---

4,213,450

## MODULAR SOLAR COLLECTOR PANEL AND MANIFOLD THEREFOR

Gilbert H. Perez, 3517 Chablis Cir., San Jose, Calif. 95132

Filed Feb. 17, 1978, Ser. No. 878,821
Int. Cl.² F24J 3/02
U.S. Cl. 126—448 4 Claims

1. A monolithic manifold unit for use in the formation of a solar energy collector panel, comprising:

(a) an elongated tubular body having a longitudinal axis and being substantially uniform in its transverse dimension over a major portion of its length, said tubular body having upper and lower portions and including an integral enlarged-diameter bell housing at one end thereof, the inner diameter of said bell housing being substantially equal to the outer diameter of the remainder of said tubular body;

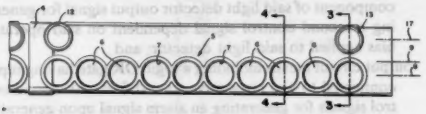
(b) a first elongated, transverse projection integrally formed on and extending in a first direction from the outer periphery of the lower portion of said tubular body and extending longitudinally therealong;

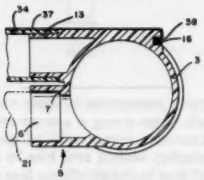
(c) a plurality of closely-spaced apertures formed in said first projection and extending therethrough to communicate with the interior of said tubular body, said apertures being arranged in an aligned series and having their axes lying in a first plane which is parallel to, and spaced to one side of, said longitudinal axis of said tubular body, the axes of said

apertures being parallel to each other and extending transverse to said longitudinal axis;

(d) shoulder means formed on the interior surface of each of said apertures, each aperture forming a socket which is separate and spaced from adjacent apertures and adapted to receive one end of an elongated heat collector tube;

(e) first and second support socket members adapted to receive support frame elements for the collector panel, said support socket members being integrally formed on the outer periphery of the upper portion of said tubular body adjacent opposite ends thereof, said socket members extending from the periphery of said tubular body in said first direction and being located directly above the end-





most apertures in said first projection, the axes of said socket members being parallel to the axes of said apertures and lying in a second plane which is parallel to said first plane, said first and second planes being located on opposite sides of the longitudinal axis of said tubular body;

(f) a second elongated transverse projection integrally formed on, and extending from, the periphery of the upper portion of said tubular body, and also extending most of the length of said manifold unit; and

(g) an elongated channel formed in said second projection, said elongated channel being parallel to said longitudinal axis and facing in a second direction opposite said first direction and being adapted to receive and secure enclosure means for the collector panel.

---

**4,213,451**

## TONGUE BLADE FOR MOUTH GAG FOR ADULTS

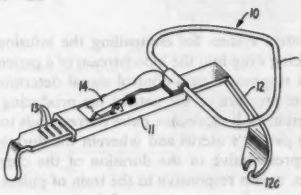
**Rudolph E. Swenson, 2748 Ptarmigan Dr. #5, Walnut Creek, Calif. 94595**

**Filed Aug. 21, 1978, Ser. No. 935,514**

**The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.**

**Int. Cl.² A61B *1/00***

**U.S. Cl. 128—12** **6 Claims**



**1. A series of tongue blades in combination with a frame, said tongue blades being formed in various sizes, each blade having a substantially straight handle portion adapted to be connected to said frame in order to form a mouth gag and a substantially straight elongated tongue-engaging portion connected at a first end to said handle portion and having an opposite distal end, said tongue engaging portion extending from said handle portion at an obtuse angle between 100° and 120°, said tongue-engaging portion having a curved tip that is formed with a radius of curvature less than one and one-half inches a distance greater than two inches from said handle portion whereby the handle portion and tongue-engaging portion of each tongue blade defines an unobstructed obtuse angular void therebetween extending from the handle portion a distance of at least two inches and a semi-circular opening at the distal end of said curved tip for guiding an endotracheal tube for anesthesia.**

---

**4,213,452**

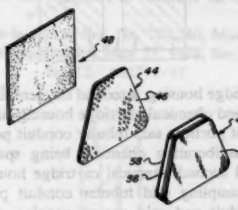
## COMPOUND SPLINT AND KIT

**Ronald D. Shippert, Englewood, Colo., assignor to The Denver Splint Company, Littleton, Colo.**

**Continuation-in-part of Ser. No. 813,800, Jul. 8, 1977, Pat. No. 4,153,051. This application May 3, 1979, Ser. No. 35,917**

**Int. Cl.² A61F *5/04***

**U.S. Cl. 128—89 R** **8 Claims**



**1. A compound splint for application to a traumatized portion of a human body, including bones to be knitted together, a base layer of thin, flexible material coated with adhesive on at least one side and adaptable to be adhesively secured to the traumatized portion, said splint comprising:**

**a secondary component having a first face adapted to be secured to the base layer and an intertwining surface formed at a second face of said secondary component; and**

**a primary restraining component of malleable metallic material having an interlacing surface to anchoringly engage said intertwining surface of said secondary component, said primary restraining component being manually formable in situ to correspond to the shape of the traumatized portion and securable in place by the connection of the intertwining and interlacing formations to prevent change in the size and shape of the traumatized portion during recovery.**

---

**4,213,453**

## BREATHING DEVICE HAVING OXYGEN DONOR CHEMICAL CARTRIDGE

**Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jan. 12, 1978, Ser. No. 868,740**

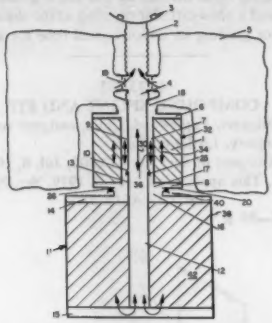
**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702192**

**Int. Cl.² A62B *7/08***

**U.S. Cl. 128—202.26** **7 Claims**

**1. A breathing device to facilitate a person's respiratory breathing of air with sufficient oxygen, comprising a breathing conduit adapted to be connected to a person, a breathing bag adjacent said breathing conduit, check valve means connecting said breathing bag to a first portion of said conduit for outflow of breathing air from said bag to said first portion of said conduit, a first chemical cartridge having a housing with an open-**

ing therethrough through which a second portion of said conduit extends, said first chemical cartridge having an oxygen-liberating chemical therein surrounding and spaced radially outwardly of said second portion of said conduit extending through said opening and defining an annular passage, said conduit having an end terminating adjacent the bottom of said first chemical cartridge, a second chemical cartridge having a cylindrical housing with a top access opening a tubular central portion extending through said access opening into said second



chemical cartridge housing, a second oxygen-liberating chemical in said second chemical cartridge housing surrounding said tubular conduit portion, said tubular conduit portion and said second oxygen-liberating chemical being spaced from the bottom of said second chemical cartridge housing, and coupling means coupling said tubular conduit portion to said breathing conduit and said access opening of said second chemical cartridge housing to said through-opening of said first chemical cartridge housing.

---

**4,213,454**

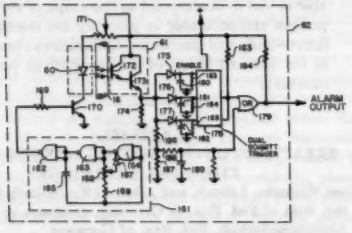
## CONTROL SYSTEM FOR METERING APPARATUS FOR A FLUID INFUSION SYSTEM

**Norm Shim, Glenview, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 2, 1977, Ser. No. 857,018**

**Int. Cl.[2] A61M 5/14**

**U.S. Cl. 128—214 E** **6 Claims**




1. In a flow metering apparatus for controlling the flow of fluid through a tubing segment of an administration set, a bubble detector comprising:

an alternating light source arranged at one side of the tubing segment;

detector means including a light detector generally arranged at the opposite side of the tubing segment for generating an output signal having direct and alternating current components, said alternating current component being dependent on the intensity of light from said light source transmitted through said tubing segment, the intensity of said transmitted light being dependent on the presence of fluid within the lumen of said tubing segment;

said detector means including circuit means for applying operating bias to said light detector, said direct current component being dependent on the level of said operating bias;

a power source for driving said light source;

a first control channel including a threshold trigger device responsive to said alternating component of said light detector output signal for generating a first control signal when the light transmitted through said tubing segment falls below a predetermined minimum level;

a second control channel responsive to said direct current component of said light detector output signal for generating a second control signal dependent on said operating bias applied to said light detector; and

output circuit means including a logic OR gate having inputs connected to and responsive to said first and second control signals for generating an alarm signal upon generation of said first control signal, or upon the failure of said circuit means to apply operating bias to said light delector.

---

**4,213,455**

## APPARATUS FOR THE INFUSION OF A LABOR-INDUCING DRUG INTO THE BLOODSTREAM OF A PATIENT

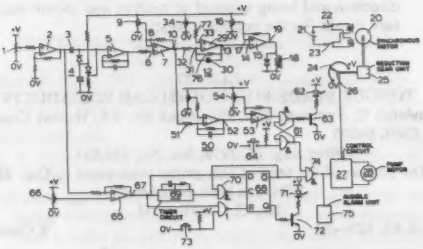
**Allan H. Ellson, Harpenden, England, assignor to Pye (Electronic Products) Ltd., Cambridge, England**

**Filed Jul. 3, 1978, Ser. No. 921,727**

**Claims priority, application United Kingdom, Jul. 5, 1977, 28058/77; Dec. 2, 1977, 28058/77**

**Int. Cl.[2] A61M 5/16**

**U.S. Cl. 128—214 E** **23 Claims**



1. A control system for controlling the infusion rate of a labor-inducing drug into the bloodstream of a patient comprising, means responsive to a control signal determined by the intra-uterine pressure of the patient for producing a train of pulses wherein each successive pulse corresponds to a contraction of the patient's uterus and wherein the duration of each pulse is representative of the duration of the corresponding contraction, means responsive to the train of pulses for generating a first signal representative of the average value of the mark-space ratio of the pulse train, and means responsive to said first signal for deriving a second signal for increasing the infusion rate when the said average value is less than a first predetermined value and for reducing the infusion rate when the average value exceeds the said first predetermined value.

4,213,456

## MEDICAL MULTI-PURPOSE INSTRUMENT

Paul E. K. Böttger, Bahnhofstrasse 35, 6050 Offenbach, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 853,381

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800659

Int. Cl.[2] A61M 5/315

U.S. Cl. 128—218 P 14 Claims

1. A multipurpose medical instrument, comprising first hollow cylinder means having a given inner diameter, a needle socket and first cap holding means surrounding said needle socket at one end of said first hollow cylinder means and an open end opposite said needle socket of said first hollow cylinder means, second hollow cylinder means operable as a plunger inside said first hollow cylinder means and having further cap holding means at each end of said second hollow cylinder means, said further cap holding means and said first mentioned cap holding means being of substantially identical construction, and a plurality of cap means all of which are also of substantially identical construction for cooperation with any of said cap holding means, said cap means having an outer diameter substantially corresponding to said given inner diameter of said first hollow cylinder means whereby one of said cap means at one end of said second hollow cylinder means may function as a piston inside said first hollow cylinder means while other cap means function as closure means.

---

4,213,457

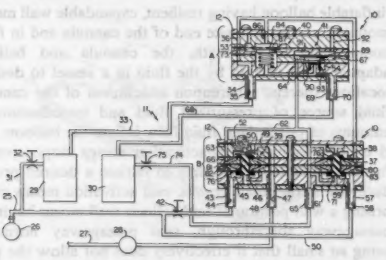
## INTERMITTENT PATIENT SUCTION SYSTEM AND CONTROL MEANS THEREFOR

Jay L. Lewis, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 15, 1977, Ser. No. 860,995

Int. Cl.[2] A61M 1/00

U.S. Cl. 128—276 10 Claims



1. In a control means for an intermittent suction system and having output means for alternately applying a vacuum and atmospheric pressure to a patient for removing fluids from said patient and wherein said system includes a vacuum source and first and second container means adapted to be interconnected to operating means of said control means and to said source and said atmospheric pressure by said operating means of said control means that is adapted to apply said vacuum through said output means to said patient in response to a vacuum condition of said first container means and to apply said atmospheric pressure through said output means to said patient in response to a vacuum condition in said second container means, the improvement comprising means in said operating means of said control means for always being adapted to interconnect said vacuum through said output means to said patient when said vacuum condition in said first container means is a certain percentage of the vacuum condition of said source regardless of the vacuum value of said source, so as to prevent any adverse interruption in said system during the use thereof for said patient should the vacuum level of said source fall to an undesirable level.

---

4,213,458

## SEALING AND ATTACHMENT ASSEMBLY FOR MEDICAL DRAINAGE POUCH

John L. Nolan, Glenview, and Harvey M. Nordby, Buffalo Grove, both of Ill., assignors to Hollister Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 783,340, Mar. 31, 1977, abandoned. This application May 17, 1978, Ser. No. 906,401

Int. Cl.[2] A61F 5/44

U.S. Cl. 128—283 25 Claims

1. A sealing and attachment assembly for a drainage pouch having a moisture-impermeable bag formed of plastic sheet material with a drainage opening in one side thereof, the sealing and attachment assembly including an adhesive patch formed of microporous sheet material with an opening therein which is generally concentric with said opening in the bag, the patch having inner and outer sides and the outer side of the patch being coated with a pressure-sensitive adhesive for attachment to the body of a wearer, wherein the improvement comprises an annular attachment ring formed of flexible sheet material, said attaching ring having inner and outer sides and an opening which is generally concentric with the openings in the bag and in the patch, the inner side of the attaching ring being attached to the bag in a first area of attachment and the outer side of the attaching ring being attached to the inner side of the patch in a second area of attachment, the second area of attachment extending radially outwardly beyond the first area of attachment to provide an annular outer portion of the attaching ring which is unconnected to the bag and which is flexible and conformable by forces which are applied to the attaching ring and to the adhesive patch and which tend to remove the adhesive patch from the body so that said annular outer portion of the attaching ring and the portion of the adhesive patch attached thereto extends substantially linearly and the tendency of the adhesive patch to tear as a result of said forces is minimized, the outer periphery of the attaching ring being spaced inwardly of the outer periphery of the adhesive

patch to provide a breathable outer portion of the adhesive patch which is uncovered by the attaching ring.

---

**4,213,459**

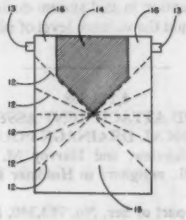
## DISPOSABLE DIAPER WITH LOCALIZED AREA OF INCREASED DENSITY

**Wayne C. Sigl, Black Creek, and Philip A. LaBorde, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Continuation of Ser. No. 736,944, Oct. 29, 1976, abandoned. This application May 12, 1978, Ser. No. 905,384**

**Int. Cl.[2] A61F *13/16***

**U.S. Cl. 128—287** **3 Claims**



1. In a disposable diaper of the type having a fluff batt as its main absorbent element and in which said diaper and said batt are defined by front and back waist-encircling ends, a pair of leg-encircling sides, a front panel section and a back panel section, the improvement wherein only a the improvement wherein only a localized contiguous area of the fluff batt in only the back panel section is comprised of a substantially uniformly deposited contiguous layer, said fluff layer of said localized area being comprised of a fluff having a substantially higher density than the density of the remainder of said back panel section and substantially higher than the density of the total whole of said front panel section, said localized area having a shape which consists of a transversely centered symetrical polygon, the number of sides in said polygon ranging from four to five, said localized area of higher density fluff comprising only the major central portion of said back panel section of the batt extending from the back waist end of the batt to the transverse mid-point of the batt, the remaining portions of the batt being undensified fluff which is in capillary association with said higher density fluff to permit unimpaired flow of fluids between said undensified fluff and said higher density fluff, said remaining portions of undensified fluff specifically including (a) the entire front panel section of the batt and (b) the two side areas of the back panel section of the batt; each of said side areas being of substantial width and extending alongside said area of higher density fluff from the front panel section of the batt to the back waist end of the batt.

---

**4,213,460**

## TICK REMOVING FORCEPS

**Israel H. Weiner, 3406 Keyser Rd., Baltimore, Md. 21208**

**Continuation-in-part of Ser. No. 753,813, Dec. 23, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,483**

**Int. Cl.[2] A61B *17/50***

**U.S. Cl. 128—303 R** **21 Claims**

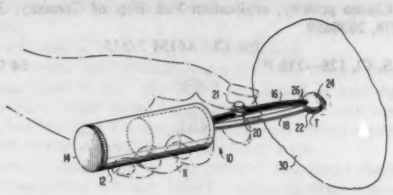
1. Apparatus for removing a parasitic organism attached to the skin of a host animal comprising, in combination:

a forceps;

mutually opposed gripping means affixed to said forceps so as to be brought together on actuation of said forceps, said gripping means being shaped to at least partially enclose the protruding portion of said parasitic organism and at least a portion of said gripping means being constructed of a thermally insulative material;

heating means mounted on said gripping means in a position to apply heat to the enclosed portion of said organism; and

control means for activating said heating means when said gripping means are engaged with said parasitic organism,



whereby said organism is induced through application of heat to release its grip on the skin of said host animal, enabling the removal of said organism with said forceps, said thermally insulative material protecting the skin of said host animal from excessive heating.

---

**4,213,461**

## MINIATURE BALLOON CATHETER

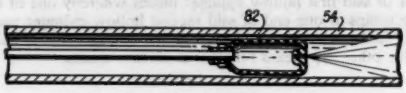
**Paul H. Pevsner, 4121 King Crest Pkwy., Richmond, Va. 23221**

**Continuation-in-part of Ser. No. 681,676, Apr. 29, 1976, Pat. No. 4,055,757. This application Sep. 15, 1977, Ser. No. 833,615**

**The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.**

**Int. Cl.[2] A61M *25/00***

**U.S. Cl. 128—348** **11 Claims**



1. A miniaturized balloon catheter assembly for use in small vessels comprising:

an elongated tubular cannula including an attaching means at one end thereof for attaching to a source of pressurized fluid and having a small outer diameter for insertion into small vessels;

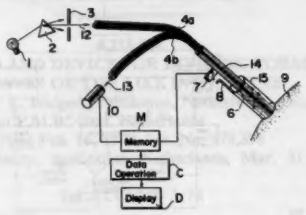
an inflatable balloon having resilient, expandable wall means mounted on the opposite end of the cannula and in fluid communication therewith, the cannula and balloon adapted to be carried by the fluid in a vessel to desired locations therein, whereupon attachment of the cannula fluid source of pressurized fluid and introduction of amounts of pressurized fluid flow inflate the balloon;

said balloon including an activation means responsive to further amounts of pressures to initiate a desired procedure within the small vessels, said activation means comprising a wall portion of said balloon wall means having a passageway therethrough, said passageway normally being so small that it effectively does not allow the passage of fluid from said balloon through said passageway, but said portion allowing the opening of said passageway in response to a predetermined amount of pressure within said balloon to allow passage of said fluid from said balloon into said vessels.

## 4,213,462
## OPTICAL ASSEMBLY FOR DETECTING AN ABNORMALITY OF AN ORGAN OR TISSUE AND METHOD

Nobuhiro Sato, 5-11, 1-Chome, Tachibana-Cho, Toyoraka-shi, Osaka-fu, Japan

Filed Aug. 18, 1978, Ser. No. 934,681
Claims priority, application Japan, Aug. 25, 1977, 52-102280
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—634 21 Claims

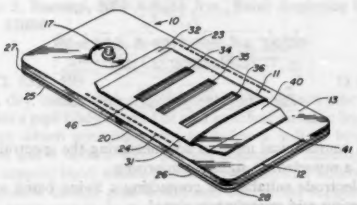



1. An optical device for detecting an abnormality in an organ or tissue in its early stages of growth comprising:
a light source assembly;
contact means including a portion for contacting a surface of an organ or tissue and capable of exerting a predetermined pressure thereon;
first means for transmitting light from the light source assembly to the tissue or organ that will be effected by the predetermined pressure;
means for measuring the light intensity reflected from the organ or tissue;
second means for transmitting reflected light from the tissue or organ that will be effected by the predetermined pressure to the means for measuring the light intensity;
means for determining a first measurement of light reflected from the organ or tissue with approximately no pressure applied and for determining a second measurement at a predetermined pressure, and
means for comparing the first and second measurements to detect whether an abnormality exists in the organ or tissue as a function of the difference in measured reflected light.

## 4,213,463
## BODY ELECTRODE WITH INDICATOR TO ENSURE OPTIMAL SECUREMENT

Paul D. Osenkarski, Orchard Park, N.Y., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,127
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—639 11 Claims

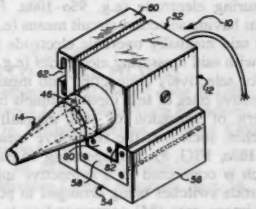


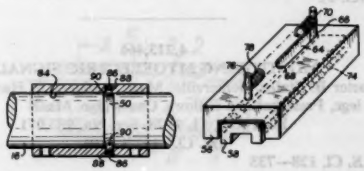

1. A body electrode for use with an electromedical instrument and removably attachable to a person's body, said electrode comprising
a manually stretchable, electrically insulating cover sheet having an outer surface adapted to face away from the body, and an inner surface adapted to face toward the body;
electric circuit means for maintaining the body in electrically conducting relation to an electromedical instrument, said electric circuit means comprising an electrically conductive inner portion adjacent said inner surface, and terminal means connected in an electrically conducting relation to said inner portion; and
indicator means to ensure proper manual adjustment of tension on said cover sheet to optimize electrical current distribution between said inner portion and the body, said indicator means comprising
an exterior sheet attached to said outer surface of said cover sheet and defining a viewing zone; and
a flap having a fixed portion attached to said outer surface of the cover sheet and a principal portion longitudinally shiftable and freely slidable between said exterior sheet and said cover sheet upon longitudinal stretching of said cover sheet, said flap including an outer surface imprinted with indicia contrasting visibly with surrounding portions of said outer surface of said flap, said indicia being visibly aligned with said viewing zone upon longitudinally stretching said cover sheet to apply a predetermined optimal degree of tension, and wherein misalignment between said viewing zone and said indicia reveals excessive and insufficient stretch tension applied to said cover sheet.

## 4,213,464
## TRANSDUCER ASSEMBLY

Louis Katz, Flushing, and Kurt W. Weil, New York, both of N.Y., assignors to Sonometrics Systems, Inc., New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,675
Int. Cl.[2] A61B 3/16
U.S. Cl. 128—645 13 Claims




10. A carriage for movably supporting a device adapted to be moved into operative engagement with the human eye, comprising:
a holder for supporting the device;
releasable retaining means on said holder engagable with complementary formed means on the device for normally retaining the device in position and being responsive to a preselected value of force within the normal operating range of said release means for releasing the device to permit relative movement between the device and said holder;
a slide for supporting said holder for rearward movement from a home position; and

biasing means for biasing said slide toward said home position.

---

4,213,465

## ELECTROENCEPHALOGRAPH

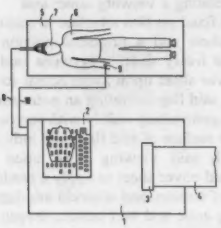
Gunnar Renheim, Vällingby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,059

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1977, 2727583

Int. Cl.[2] A61B 5/04

U.S. Cl. 128—731 18 Claims



1. An electroencephalograph comprising a number of measuring electrodes for emplacement on the head of the patient, signal amplifiers whose input channels are connectable to the measuring electrodes, selector means for connecting the measuring electrodes to the input channels in accordance with a pattern selection program, and recorders connected with the respective signal amplifiers and controlled by the output signals of the signal amplifiers, characterized in the selector means (2) having a head-image area (84), and having one manually operable electrode switch (e.g. 95–100, FIG. 5) for each measuring electrode (e.g. 95*a*–100*a*, FIG. 5), said selector means having selection circuit means (e.g. 152, 154) connected with said manually operable electrode switches (e.g. 95–100) and with said measuring electrodes (e.g. 95*a*–100*a*) and operable for selectively connecting said measuring electrodes with respective ones of said input channels in accordance with the pattern of actuation of said manually operable electrode switches, such that the respective measuring electrode (e.g. 95*a*–100*a*, FIG. 5) corresponding to each actuated electrode switch is connected to a respective input channel, and said electrode switches being arranged in positions relative to the head-image area (84) corresponding to the application locations of the respective measuring electrodes (e.g. 95*a*–100*a*, FIG. 5).

---

4,213,466

## MONITORING MYOELECTRIC SIGNALS

Foster B. Stulen, Somerville, Mass., assignor to Harvard College, President and Fellows, Cambridge, Mass.

Filed Aug. 11, 1978, Ser. No. 933,071

Int. Cl.[2] A61B 5/05

U.S. Cl. 128—733 1 Claim

1. In a neurological monitor for measuring the spectral variation in a myoelectric signal, said monitor being of the type including

an electrode suitable for contacting a living being and detecting said myoelectric signal,

circuitry for processing said myoelectrical signal to provide a display signal representative of said spectral variation, said circuitry comprising

means for amplifying said myoelectric signal to provide an amplified signal,

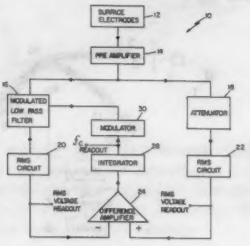
filter means for providing a filtered signal corresponding to a portion of said amplified signal having frequency components on one side of a variable cutoff frequency,

means for comparing said filtered signal to a reference signal and providing a control signal that is dependent on the difference in magnitude between said filtered and reference signals,

means for automatically varying said cutoff frequency in accordance with the value of said control signal,

means for providing a display signal representitive of said spectral variation in said myoelectric signal, and

a display driven by said display signal, for observing said spectral variation in said myoelectric signal,



the improvement comprising an attenuator for receiving said amplified signal and producing said reference signal, the attenuation being selected to make the magnitudes of said reference and filtered signals equal when said cutoff frequency is set at a median frequency of said myoelectric signal,

whereby said circuitry will tend to adjust said cutoff frequency to said median frequency.

---

4,213,467

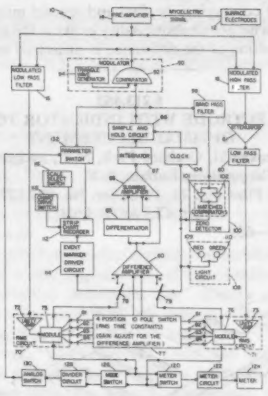
## MONITORING MYOELECTRIC SIGNALS

Foster B. Stulen, Somerville, and Carlo De Luca, Wellesley, both of Mass., assignors to Harvard College, President and Fellows, Cambridge, Mass.

Filed Aug. 11, 1978, Ser. No. 933,072

Int. Cl.[2] A61B 5/05

U.S. Cl. 128—733 18 Claims



1. A neurological monitor for measuring the spectral variation in a myoelectric signal, comprising

an electrode suitable for contacting a living being and detecting said myoelectric signal,

circuitry for processing said myoelectric signal to provide a display signal representative of said spectral variation, said circuitry comprising

means for amplifying said myoelectric signal to provide an amplified signal,

filter means for providing a filtered signal corresponding

to a portion of said amplified signal having frequency components on one side of a variable cutoff frequency,
means for comparing said filtered signal to a reference signal and providing a control signal that is dependent on the difference in magnitude between said filtered and reference signals,
means for automatically varying said cutoff frequency in accordance with the value of said control signal,
means for providing a display signal representative of said spectral variation in said myoelectric signal, and
a display driven by said display signal, for observing said spectral variation in said myoelectric signal.

---

**4,213,468**

## METHOD AND DEVICE FOR DIVIDING TOBACCO LEAVES OR THE LIKE INTO PIECES

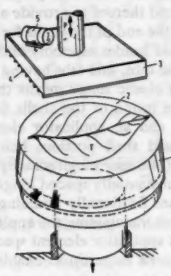
**Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to B.V. Arenco P.M.B., Best, Netherlands**

**Filed Feb. 16, 1978, Ser. No. 878,398**

**Claims priority, application Netherlands, Mar. 31, 1977, 7703538**

**Int. Cl.[2] A24B *5/16***

**U.S. Cl. 131—145** **10 Claims**



1. A method of dividing tobacco leaves or the like into pieces, which comprises the steps of:
(a) engaging one side of a leaf with a cutting edge while engaging the opposite side of the leaf with an elastically yielding member, to exert pressure on the leaf;
(b) maintaining the leaf, during step (a), in spread condition; and
(c) relatively vibrating the cutting edge and elastically yielding member during step (a), to force the cutting edge through the leaf without affecting said elastically yielding member.

---

**4,213,469**

## SMOKER'S PIPE HAVING A HOLLOW PIPE BODY FORMED FROM METALLIC HALF SECTIONS

**George S. Ramsay, 1009 Aragon Ave., Saint Augustine Shores, Fla. 32084**

**Filed Mar. 8, 1979, Ser. No. 18,769**

**Int. Cl.[3] A24F *5/01***

**U.S. Cl. 131—199** **11 Claims**

1. A dry, cool smoking and lightweight smoker's pipe which includes a pipe body formed of two attached metallic body half sections which are configured to define a hollow bowl seat portion and a hollow stem portion connected thereto; a thin metal support bowl means positioned within said hollow bowl seat portion of said pipe body, said thin metal support bowl means having a hole in the side thereof facing said hollow stem portion of said pipe body, a clay bowl means positioned within said thin metal support bowl means, said clay bowl means having a threaded hole in the side thereof aligned with the hole in the side of the thin metal support bowl means; a protecting ring means positioned over the tip of said clay bowl and attached to said hollow bowl seat portion of said pipe body; a hollow funnel means extending through the hole in said thin metal bowl means and threadably connected with the threaded hole in said clay bowl means, an enlarged head portion thereof

facing said hollow stem portion of said pipe body; and a mouthpiece attached to the end of said hollow stem portion of said pipe body opposite the end connected to said hollow bowl seat portion.

---

**4,213,470**

## TOBACCO-SMOKE FILTERS

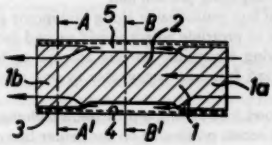
**Henry G. Horsewell, Totton; John D. Green; John A. Luke, both of Romsey, and Raymond J. Harrison, North Baddesley, all of England, assignors to British-American Tobacco Company Limited, London, England**

**Filed Nov. 10, 1977, Ser. No. 850,071**

**Claims priority, application United Kingdom, Nov. 19, 1976, 48404/76**

**Int. Cl.[2] A24B *15/02***

**U.S. Cl. 131—261 B** **7 Claims**



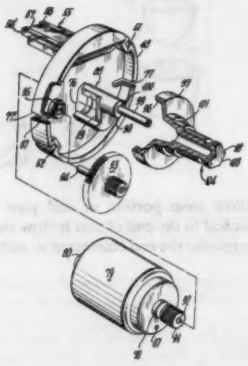
1. A tobacco-smoke filter having an axial flow filter body comprising at least one intermediate section which is located between end sections, has a cross section less than that of the end sections and lies wholly within the outline of the latter sections as viewed axially of the body, and a porous wrap of sheet material which has a porosity of at least 3,000 W.T. units and is pervious to volatile constituents of tobacco smoke and which forms, with said body, a smoke passage bounded by said porous sheet material around substantially the whole periphery of the body, from which passage said constituents can be removed from the smoke by diffusion through the said sheet material, each of the said sections being made of filter material.

4,213,471

## MANICURING UNIT

Paul D. Burian, Elmsford, and Arthur T. Sempliner, New York, both of N.Y., assignors to Clairol, Inc, New York, N.Y.

Division of Ser. No. 683,854, May 6, 1976, Pat. No. 4,103,694.
This application May 15, 1978, Ser. No. 905,770
Int. Cl.[2] A45D *29/05*; B24D *17/00*
U.S. Cl. 132—73.6 6 Claims



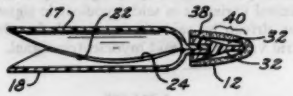
1. A sub-assembly for portable manicure units comprising
(a) a bulkhead adapted to be mounted transversely of the manicure unit,
(b) said bulkhead having a generally flat face having
(c) an aperture therein,
(d) a protruding pin positioned to engage
(e) a motor having a casing portion positioned within said aperture,
(f) said bulkhead having a second face including
(g) a pair of recesses positioned on opposite sides of said aperture,
(h) a pair of slots in said bulkhead and extended inwardly from opposite edges thereof toward said pair of recesses,
(i) a yoke having
(j) a motor-engaging portion and
(k) a pair of legs positionable along said motor and through said slots to protrude adjacent said second face, said legs each having a terminal portion adapted to bear against said second face and engageable in one of said pair of recesses,
(l) said second face having a protrusion including
(m) an axle recess positioned on the center line of the bulkhead and
(n) a lateral gear aperture,
(o) a pinion gear on said motor and positioned adjacent said lateral gear aperture,
(p) a cluster gear rotatably mounted on said second face and having
(q) a major gear in meshing relationship with said pinion gear through said lateral gear aperture and
(r) a minor gear, and
(s) an output gear mounted on
(t) an axle positioned on the center line of the bulkhead in said axle recess and having
(u) internal teeth in meshing engagement with said minor gear of said cluster gear.

4,213,472

## FINGER MOUNTABLE MAKEUP APPLICATOR

Jean-Louis H. Gueret, Paris, France, and Nancy Adams, Westport, Conn., assignors to L'Oreal, Paris, France

Filed Aug. 3, 1978, Ser. No. 930,856
Int. Cl.[2] A45D *40/26*
U.S. Cl. 132—88.7 10 Claims




1. A makeup applicator for mounting on a finger of the user comprising, a holder assembly formed from a semi-rigid material and comprising first and second elongate shell portions in opposed relation to each other, said shells presenting a substantially closed end, each of said shells opening in a direction away from said tip to receive between and within the shells a finger of the user, each shell having an integral tab substantially narrower than its shell and projecting longitudinally beyond the closed end thereof to provide a projection, mounting means adjacent the end of the shells for mounting an applicator element on said holder assembly and being received on the projection of said tabs, said tabs having resilient characteristics to provide an elastic hinge means that urges the shells together so that the inside of the shells frictionally grip the finger of the user, and an applicator element fitted to said mounting means, said shell portions being dimensioned to receive the finger of the user longitudinally therein so that the tip of the finger is substantially spaced longitudinally from said end, said hinge means frictionally retaining the holder on the user's finger to permit maintaining the applicator on the finger of the user with said applicator element spaced at a convenient distance from the user's fingertip to enable easiiy applying a cosmetic product.

---

4,213,473

## AFRO OIL COMB

Oscar E. Dawson, 2224 16th Ave., Sacramento, Calif. 95822

Filed Aug. 10, 1977, Ser. No. 823,270
Int. Cl.[2] A45D *24/22*
U.S. Cl. 132—113 1 Claim

1. A comb for dispensing a controllable amount of oil to the hair of the user comprising in combination: a conically tapering hollow handle having a threaded end cap at a larger extremity of said handle and a valve closure at a narrower extremity within the hollowing of said handle, said handle is fashioned from deformable, resilant material having a memory to return to an original non-stressed condition, whereby when said handle is squeezed, said valve is opened and when said handle is not squeezed, said valve is closed, a first hollow passageway communicating with said valve, downstream thereof and upwardly angulated relative to an axial extent of said handle, a second tubular passageway connected to said first passageway at the extremity remote from said valve, said second passageway disposed parallel to, but away from said handle, a plurality of hollow teeth extending downwardly from said second pas-

sageway crossing substantially medially over an extended axial line generated from said handle, said teeth provided with openings at their extremities remote from said second passageway so that a further line extending to said teeth extremities from the terminal portion of said handle at its juncture with said first hollow passageway defines an isosceles triangle with the equal sides being said further line and said first hollow passageway and the base being the tooth nearest the handle whereby a liquid disposed on said handle can be dispensed through said teeth and the upward angulation of said first passageway and the medial disposition of said teeth relative to the extended axial line provide a balanced comb.

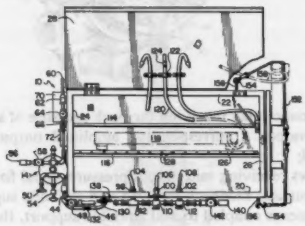
---

**4,213,474**

## VEHICLE RADIATOR CLEANING AND TESTING SYSTEM

**Frank Harrison, P. O. Box 1824, Kansas City, Mo. 64141**

**Filed Aug. 3, 1979, Ser. No. 63,428**
**Int. Cl.³ B08B 9/00, 3/00**
**U.S. Cl. 134—102** **12 Claims**



1. A unitary system for cleaning vehicle radiators comprising:
a tank for receiving the radiator to be cleaned;
a steam generator associated with said tank;
means placing the steam generator into communication with the interior of the radiator to be cleaned whereby to direct steam through the interior of the radiator; and
means for directing the steam which has passed through the interior of the radiator upon the exterior of the radiator in the tank.

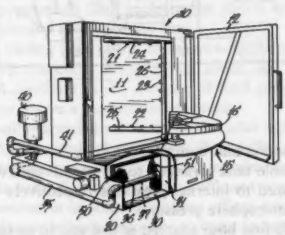
---

**4,213,475**

## POWER PARTS WASHER

**Gary E. Minkin, 12528 Post Grove, St. Louis, Mo. 63141**

**Filed Feb. 5, 1979, Ser. No. 9,168**
**Int. Cl.² B08B 3/02**
**U.S. Cl. 134—111** **4 Claims**



3. A power parts washer for automotive parts and the like having a cabinet with a washing chamber and a sump therebeneath, spray means in said washing chamber including a plurality of spray nozzles for directing a liquid including a chemical such as a detergent against parts in said chamber with the liquid thereafter flowing to said sump and including grit in the form of large particles removed from the parts being washed, a first conduit having an inlet positioned in an intake section of said sump, a pump connected to said first conduit, a second conduit extended between said pump and said spray means, filter means consisting of one or more coarse filters positioned in said sump to filter liquid flowing to said intake section and having relatively large pores of a size of up to approximately ¼' diameter to permit flow of grit therethrough, and said spray nozzles each having an approximately round opening of a diameter greater than that of the grit which passes through the filter to permit flow of liquid and grit out of the nozzles.

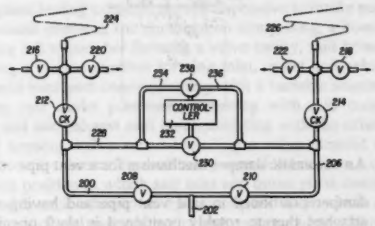
---

**4,213,476**

## METHOD AND SYSTEM FOR PRODUCING AND TRANSPORTING NATURAL GAS

**Don A. Bresie; Donald W. Fowler, and Jack M. Burns, all of Austin, Tex., assignors to Texas Gas Transport Company, Austin, Tex.**

**Filed Feb. 12, 1979, Ser. No. 11,683**
**Int. Cl.² F17C 5/02**
**U.S. Cl. 137—2** **16 Claims**




1. The method for producing and transporting natural gas from a gas well(s) location, wherein said gas well(s) is connected with a gathering manifold system and said gathering manifold system is connected with a loading manifold system, said method including the steps of:
connecting a first, movable separate pressure vessel means to said loading manifold system;
filling said first, movable separate pressure vessel means with natural gas transmitted thereto through said gathering manifold system and said loading manifold system, said natural gas being compressed by compressor means provided in said gathering manifold system to a pressure in excess of at least about 800 psia if it is not already at that pressure when entering said gathering manifold system from said gas well(s), said filling of said first, movable separate pressure vessel means being terminated after said pressure vessel means contains a selected discrete batch volume of natural gas in a relatively static confined state compressed to a pressure in excess of at least about 800 psia, and said filling proceeding substantially continuously at a generally constant, preselected rate of flow chosen to maintain a preselected, generally constant preferred rate of withdrawal from said gas well(s);
connecting a second separate pressure vessel means to said loading manifold system, at a time prior to when filling of said first, movable separate pressure vessel means is complete;
switching from said first, movable separate pressure vessel means to said second pressure vessel means when said first, movable separate pressure vessel means becomes filled, without any substantial interruption in flow whereby to maintain a substantially constant natural gas flow;
filling said second separate pressure vessel means in the same manner as said first separate pressure vessel means, while said first, movable separate pressure vessel means is removed and replaced;
replacing said filled, first movable separate pressure vessel

means with an empty, movable separate pressure vessel means, while said second pressure vessel means is being filled, and before completion of filling thereof; and

transporting said filled, first movable separate pressure vessel to an off-loading terminal, where it is emptied and then returned to said gas well(s) location.

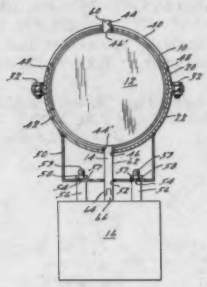
---

**4,213,477**

## AUTOMATIC DAMPER FOR FURNACE VENT PIPE

**Robert L. Velasquez, 11422 Minden, Detroit, Mich. 48205**

**Filed Feb. 12, 1979, Ser. No. 11,374**
**Int. Cl.[2] F16K *13/00***
**U.S. Cl. 137—15** **12 Claims**



1. An automatic damper mechanism for a vent pipe comprising

a damper positioned in said vent pipe and having a shaft attached thereto rotably positioned in shaft openings in said vent pipe,

a motor connected to said shaft and adapted to operate said damper, and

a collar mounting bracket comprised of a first section and a second section which are positioned around said vent pipe forming a ring,

said first section having an elongated slot therein which is utilized as a template for making a corresponding slot in said vent pipe in order to position said damper therein,

said section section positioned on said vent pipe covering said slot therein which was used to insert the damper, and

mounting means on said second section for mounting said motor thereon.

---

**4,213,478**

## TRANSDUCER ASSEMBLY PROVIDING PNEUMATIC OUTPUT PROPORTIONAL TO ELECTRICAL INPUT SIGNAL

**Everett O. Olsen, Wrentham; Robert F. Estes, Foxboro; Paul W. Rezendes, New Bedford, all of Mass., and George F. Williams, Rumford, R.I., assignors to The Foxboro Company, Foxboro, Mass.**

**Continuation of Ser. No. 776,575, Mar. 11, 1977, abandoned.**
**This application Dec. 21, 1978, Ser. No. 972,096**
**Int. Cl.[2] F15B *5/00*; G05D *16/20***
**U.S. Cl. 137—85** **14 Claims**

1. A current to pneumatic output pressure transducer comprising:

a housing;

a casing of magnetically soft ferrous material mounted within said housing;

a permanent magnet having opposed north and south poles, said magnet being rigidly mounted within said casing and spaced therefrom;

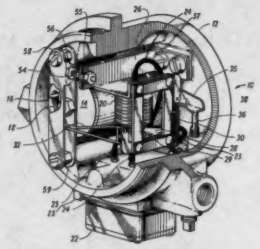
a coil pivotally suspended within said casing within the field of said magnet and rotatable thereabout in the space between said magnet and said casing;

a flapper mounted on said coil at a point radially offset from the rotational axis thereof to produce arcuate movement of said flapper with rotary motion of said coil;

means for applying an electrical input current to said coil thereby inducing an angular rotation of said coil and said flapper, the angular position thereof being proportional to the magnitude of said applied current;

a shiftable support pivotally mounted on said housing adjacent said casing;

a pneumatic nozzle mounted on said support and located in close proximity to said flapper so that said nozzle may be covered by said flapper so as to generate a back pressure;



a pneumatic relay receiving the back pressure of said nozzle to produce a corresponding amplified output pressure signal;

a bellows receiving said output pressure signal for applying a pneumatic feedback force to said shiftable support;

spring means coupled to said shiftable support, the restraining forces of said spring means producing a change in position of said nozzle that corresponds essentially linearly with the movement of said flapper, whereby said output pressure signal is proportional to said applied input current.

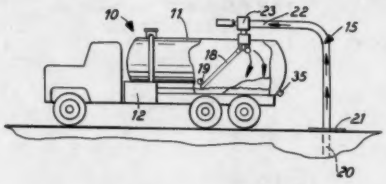
---

**4,213,479**

## EDUCTION UNIT

**Leland E. Pearson, Galva, Ill., assignor to Industrial & Municipal Engineering, Inc., Galva, Ill.**

**Filed Nov. 7, 1978, Ser. No. 958,332**
**Int. Cl.[2] B08B *9/08, 13/00***
**U.S. Cl. 137—493** **9 Claims**



1. An eduction unit comprising:

(a) a portable tank arranged to be selectively evacuated or pressurized to internal pressures respectively below and above atmosphere pressure;

(b) a single first hose adapted at one end to be inserted into a mixture of solids and liquids external to said tank, said first hose being supported at its other end at the top of said tank;

(c) a normally closed first check valve communicating said other end of said first hose with the interior of said tank, and openable in response to said tank's being partially evacuated;

(d) a second hose adapted at one end to be inserted into any

liquid contents within said tank, said second hose being supported at its other end near the top of said tank; and

(e) a normally closed second check valve communicating said other end of said first hose with said other end of said second hose, and openable in response to said tank's being pressurized above atmospheric pressure.

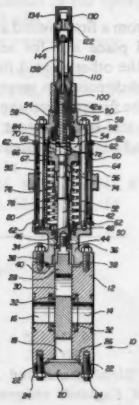
---

**4,213,480**

## MANUAL OVERRIDE FOR HYDRAULIC GATE VALVE ACTUATORS

**Paul R. Orum, Stafford, and Larry A. Vyvial, Rosenberg, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.**

**Filed Dec. 26, 1978, Ser. No. 973,517**
**Int. Cl.³ F16K *37/00, 31/00, 31/44***
**U.S. Cl. 137—556** **14 Claims**



1. An actuator device for a subsea gate valve having a gate movable between open and closed positions, said actuator device comprising:

an externally threaded valve stem fixed to said gate for movement with the gate between open and closed positions thereof;

a piston connected to said valve stem;

a cylinder closely receiving said piston and adapted to receive pressurized fluid to force the piston and stem in a first direction axially of the stem;

a spring biasing said piston in a second direction opposite said first direction to move said piston and stem in the second direction in the absence of fluid pressure in said cylinder above a predetermined level;

an internally threaded nut member threaded onto said valve stem for longitudinal movement therewith;

means limiting movement of said nut member axially on said stem in both directions so that sufficient rotation of said nut member in opposite directions effects axial movement of said stem in both directions to open and close the gate;

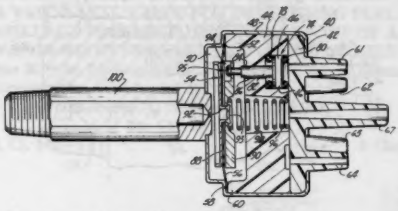
a sleeve telescoped on said nut member, and spline means connecting the sleeve and nut member so that rotation of said sleeve is translated into rotation of said nut member but said nut member is movable within and relative to such sleeve axially of the valve stem for the entire travel of the gate between open and closed positions, said sleeve being adapted to be rotated manually to effect movement of the gate between its open and closed positions.

**4,213,481**

## VALVE CONTROL MECHANISM

**Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.**

**Continuation of Ser. No. 829,225, Aug. 31, 1977, abandoned. This application Mar. 29, 1979, Ser. No. 24,968**
**Int. Cl.² F16K *11/04***
**U.S. Cl. 137—596.18** **4 Claims**



1. A control mechanism for turbo charged internal combustion engines having a control device responsive to intake manifold vacuum pressure, the combination comprising; a housing including a first member forming a valve cavity, said housing including a second member forming inlet, outlet and exhaust ports, said inlet port communicating with a variable source of vacuum, said outlet port communicating with said control device and said exhaust port communicating with the exterior of said housing, valve means including a valve element disposed in said valve cavity and being movable between a normal open position in which said inlet and outlet ports communicate with each other to an operative position in which said inlet port is closed and said outlet port communicates through passage means in said second member with said exhaust port and said control device, a movable wall a third member holding said movable wall relative to said second member and forming a control chamber at one side of said movable wall, the other side of said movable wall being connected to said valve element, a control port connected to said control chamber and being connected to said engine manifold, spring means biasing said movable wall to a first position to maintain said valve element in said normal open position in the presence of a pressure in said control chamber no greater than atmospheric pressure, said movable wall being movable to a second position in the presence of a positive pressure greater than atmospheric pressure to move said valve element to said operative position to isolate said control device.

---

**4,213,482**

## HYDRAULIC COUPLER

**John T. Gondek, P.O. Box 21013, Minneapolis, Minn. 55421**

**Continuation of Ser. No. 290,562, Sep. 18, 1972, abandoned, which is a continuation of Ser. No. 101,076, Dec. 23, 1970, abandoned. This application Oct. 25, 1978, Ser. No. 954,616**
**Int. Cl.³ F16L *37/22***
**U.S. Cl. 137—614.01** **5 Claims**

1. A detachable hydraulic coupler including:

a male portion and a cooperable female portion, said male portion being engaged with a free end extremity of said female portion when said coupler is in a coupled position,

a valve in each of said portions,

means normally urging said valves toward closed position, a plurality of angularly spaced apertures in said female portion encircling said male portion,

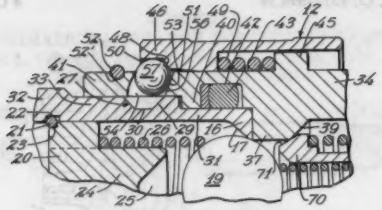
a locking ball in each of said apertures,

said male portion having a groove in its outer surface into which said locking balls may extend to hold said male and female portions engaged,

a collar encircling said female portion and slidably suported thereby for movement between two extreme positions,

said collar in one extreme position holding said locking balls engaged in said groove in said male portion,

said apertures having their axes extending at an acute angle with respect to the axis of said coupler, said angle in each instance inclining outwardly and away from said end extremity of said female portion,



said groove having a wall extending at substantially fifteen degrees with respect to the axes of said apertures and said apertures each having a side extending at said acute angle and said balls being disposed between said groove wall and said sides of said apertures when said coupler is in said couple position.

---

**4,213,483**

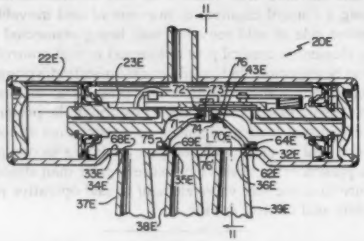
**REVERSING VALVE CONSTRUCTION AND PARTS THEREFOR AND METHODS OF MAKING THE SAME**

**Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 825,956, Aug. 19, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,483**

**Int. Cl.[2] F16K *27/04***

**U.S. Cl. 137—625.29** **22 Claims**



1. In a tubular housing means for a reversing valve construction having a movable piston-like valve member that controls port means of a valve seat means of said housing means through the relative position of passage means of said valve member relative to said port means, the improvement wherein said valve seat means is an integral homogeneous part of said tubular housing means and has a substantially flat valve seat surface.

---

**4,213,484**

**SINGLE HANDLE CONTROL APPARATUS**

**Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

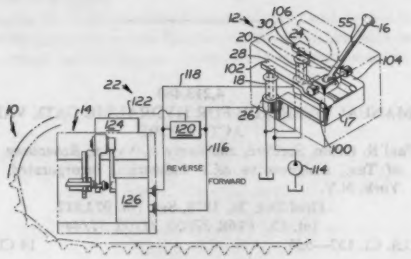
**Filed May 30, 1978, Ser. No. 910,250**

**Int. Cl.[2] F16K *11/18***

**U.S. Cl. 137—636.1** **15 Claims**

1. In a control apparatus having a frame, a control handle, first and second work elements, first and second ramps each being independently, pivotally movable relative to the frame and being in contact with a respective work element, each of said work elements being movable between a plurality of positions in response to pivotally moving said respective ramps between a plurality of positions, the improvement comprising:

first means for selectively, progressively pivoting only one of the first and second ramps in a preselected direction in response to moving the control handle in a first plane to a first position located in said first plane and in a different



second plane from a first toward a second position located in said second plane and for selectively, progressively pivoting only the other of said first and second ramps in said preselected direction in response to moving the control handle in the first plane to a second position located in said first plane and in a different third plane from a first toward a second position located in said third plane.

---

**4,213,485**

**HOSE**

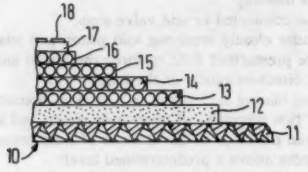
**Roger J. Ottewell, Birmingham, and Jack M. Lowe, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England**

**Filed Jul. 26, 1978, Ser. No. 928,146**

**Claims priority, application United Kingdom, Jul. 28, 1977, 31730/77**

**Int. Cl.[2] F16L *11/08***

**U.S. Cl. 138—130** **27 Claims**



1. A flexible hose comprising a lining layer of substantially impermeable material, a reinforcement structure comprising at least one balanced pair of helically extending reinforcement members, embedded in elastomeric material, to withstand internal pressure and axial tensile loadings, and radially inwards of at least the reinfocement structure an armouring layer to resist radial crushing loads, said armouring layer comprising one pair of helical reinforcing elements nested together and shaped such that contacting surfaces of the elements between the successive turns of the helices are of a substantially frusto-conical shape.

## 4,213,486

## COATED PIPE AND PROCESS FOR MAKING SAME

Carlos M. Samour, Wellesley; Earl G. Jackson, Bedford; Samuel J. Thomas, Hamilton, all of Mass., and Louie E. Davidson, Londonberry, N.H., assignors to The Kendall Company, Boston, Mass.

Filed Nov. 6, 1978, Ser. No. 958,310
Int. Cl.[2] F16L 9/14; B65H 81/00
U.S. Cl. 138—143 16 Claims

1. A coated article comprising a metallic pipe having a protection layer thereon, said layer comprising a first layer bonded to the pipe of an epoxy coating derived from a bis-phenol A polymer of 2 to 10 mils and an adhesive faced thermoplastic polymer tape wrapping adhesively bonded to said epoxy coating, said protection layer being from 6 to about 50 mils in thickness.

11. A process for externally protecting metal pipe which comprises providing heated pipe, electrostatically applying fusible Epoxy resin powder derived from a bis-phenol A polymer to the exterior surface of the metal to form a continuous coating of from 2 to 10 mils in thickness and thereafter spirally wrapping an adhesive-faced flexible thermoplastic polymer substrate so that the thickness of the epoxy coating and tape wrapping is from 6 to 50 mils.

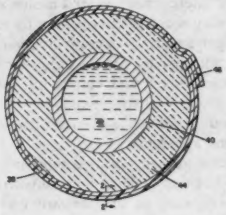
---

## 4,213,487

## LAMINATE OF METAL WITH THERMOPLASTIC MATERIAL

Smith A. Funk, Tampa; Charles J. Klasen, Seminole, and Ilmars Vilmanis, St. Petersburg, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Jan. 26, 1978, Ser. No. 872,497
Int. Cl.[2] F16L 9/14
U.S. Cl. 138—149 1 Claim



1. A conduit for transporting fluids through atmospheric air comprising:

A. a pipe;

B. thermal insulation surrounding the pipe;

C. a moisture vapor barrier completely surrounding the thermal insulation said moisture vapor barrier constituting a laminate comprising:

I. an aluminum sheet:

(a) having a thickness of 0.001 to 0.1 inch;

(b) having on its surfaces an adhesion-promoting amount of a copolymer of vinyl chloride and vinyl acetate; and

II. an upper sheet of thermoplastic material adhering to the top of the aluminum sheet; and

III. a lower sheet of thermoplastic material adhering to the bottom of the aluminum sheet;

wherein the thermoplastic material consists essentially of:

(a) chlorinated polyethylene:

(1) having a melt viscosity of 8,000 to 25,000 poises;

(2) comprising from 25 to 50 percent by weight chlorine;

(3) having a crystallinity of less than 3%;

(4) having a glass transistion temperature of less than 20° C.; and

(b) calcium carbonate having a particle size such that it passes through a U.S. standard screen of 100 mesh/inch;

wherein the weight ratio of a:b is 1:5 to 5:1;

(c) a pigment comprising from 1 to 35 percent by weight of the thermoplastic material; and

(d) a stabilizer.

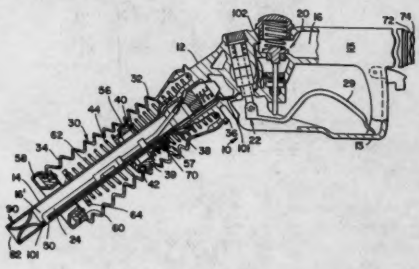
---

## 4,213,488

## VALVE MEANS RESPONSIVE TO THE OPERATION OF A VAPOR-SEAL VALVE FOR PREVENTING FUEL SPILLAGE FROM THE DISCHARGE SPOUT OF A VAPOR-RECOVERY FUEL DISPENSING NOZZLE

Walter R. Pyle, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 4, 1978, Ser. No. 965,967
Int. Cl.[3] B65B 3/18
U.S. Cl. 141—1 8 Claims



1. A vapor-recovery fuel dispensing nozzle, comprising:

a nozzle main body portion;

a discharge spout projecting from the main body portion, said discharge spout having an outlet end proportioned for ease of insertion into a fill pipe of a fuel tank;

a flow passage extending through said discharge spout and the nozzle main body portion for the flow of fuel therethrough;

a flow control valve in the nozzle main body portion operable to regulate the flow of fuel through said flow passage;

a vapor recovery passage means formed in the main body portion;

a vapor recovery shroud disposed radially outwardly from said discharge spout and having an inner end and an outer end, the inner end of said shroud connected to the nozzle main body portion in communication with said vapor recovery passage means;

a sealing collar at the outer end of said shroud for engagement with the fill pipe opening when said discharge spout is inserted therein in use of said nozzle to direct vapor expelled from the fuel tank during refueling to said vapor recovery passage means by way of said shroud;

a vapor-seal valve for said nozzle operable to be in a closed position to prevent the escape of vapors through the outer end of said shroud when said nozzle is not in use and to be in an open position when said discharge spout is inserted into the fill pipe in use of said nozzle so that vapor expelled from the fuel tank during refueling may be directed by way of said shroud to said vapor recovery passage means;

valve means responsive to the operation of said vapor-seal valve located in said discharge spout at the outlet end thereof for sealing the outlet end of said discharge spout to prevent the flow of fuel therethrough when said vapor-seal valve is in a closed position and for opening the outlet end of said discharge spout to permit the flow of fuel therethrough when said vapor-seal valve is in an open position; and

means in communication with said vapor-seal valve and said valve means for closing said valve means to prevent the

flow of fuel through the outlet end of said discharge spout when said vapor-seal valve is in a closed position and for opening said valve means to permit the flow of fuel through the outlet end of said discharge spout when said vapor-seal is in an open position.

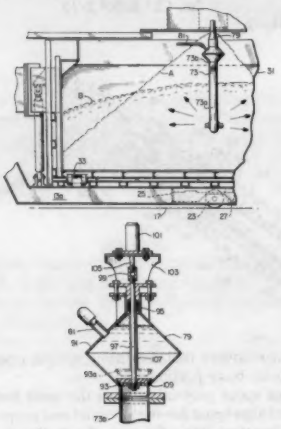
---

**4,213,489**

## ONE-SPOT COKE QUENCH CAR COKE DISTRIBUTION SYSTEM

George R. Cain, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 834,125, Sep. 19, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,321
Int. Cl.[3] C10B *39/14*
U.S. Cl. 141—70 4 Claims



1. A one-spot coke quench car comprising:
(a) a wheel-mounted frame;
(b) a receptacle mounted to said frame into which incandescent coke is pushed from a coke oven;
(c) at least one water metering storage chamber means, for containing a predetermined volume of water under pressure, juxtaposed to said receptacle, comprising:
(1) an upper frusto-conical portion open at both ends,
(2) a lower frusto-conical portion open at both ends, fixed to said upper frusto-conical portion such that the larger diameters of said upper frusto-conical end portion and said lower frusto-conical end portion abut at the point of fixation to form a chamber having a central axis passing through the open smaller diameters of said upper frusto-conical portion and said lower frusto-conical portion;
(3) a valve disc positioned perpendicular to said central axis and disposed to seal the open smaller diameter of said lower frusto-conical portion;
(4) a valve stem, fixed to said valve disc, projecting through the open smaller diameter of said upper frusto-conical portion coaxial to said central axis;
(5) a packing gland sealing said smaller diameter of said upper frusto-conical portion around said stem such that said valve stem protrudes through said packing gland; and
(6) inlet means through which water can enter said water metering storage chamber.
(d) pressurization means by which said predetermined volume is conveyed into said water metering storage chamber means and pressurized therein;
(e) discharge means by which said predetermined volume is released from said water meter storage chamber means;
(f) conduit means by which said predetermined volume is conveyed, after release, into the center core of said incandescent coke within said receptacle; and
(g) dispersement means by which said predetermined volume is brought from said conduit means into direct contact with said center core of said incandescent coke within said receptacle, whereat said predetermined volume is rapidly and explosively converted into steam to disrupt and redistribute said incandescent coke within said receptacle prior to quenching.

---

**4,213,490**

## INSULATION GUN

Harry A. Knock, 388 Marvin Pl., Wheeling, Ill. 60090

Filed Nov. 27, 1978, Ser. No. 963,823
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—311 R 2 Claims

1. In combination:
(a) a confined building wall space defined by parallel wall portions and interconnecting stud means, one of said wall portions having a cutout fill opening therein;
(b) insulation gun apparatus operatively interconnected with said cutout fill opening for injecting particulated insulation material through said cutout fill opening into said confined building wall space; and
(c) particulated insulation material disposed within said insulation gun apparatus;
(d) said insulation gun apparatus comprising
(i) a tubular housing defining a loading chamber having a discharge opening at the forward end threreof, said particulated insulation material being disposed within said loading chamber,
(ii) a piston assembly for ejecting said particulated insulation material from said loading chamber through said discharge opening, said piston assembly comprising a piston disposed for reciprocal movement within, and in the axial direction of, said loading chamber and a piston rod, including a handle portion, connected with said piston and projecting in the axial direction of said tubular housing for reciprocating said piston in response to movement of said handle portion by an operator, and
(iii) a fill nozzle removably connected with said tubular housing at said discharge opening and engaging said one wall portion, said fill nozzle comprising a tapered housing defining a discharge port in communication with said loading chamber and having an annular, axially projecting lip circumscribing said discharge port and extending through said cutout fill opening,
(iv) wherein said insulation gun apparatus further includes a plunger for breaking up compacted accumulations of said particulated insulation material within said loading chamber, said plunger being separate from, an parallel to, the said piston rod and slidably and transversely extending through said piston into said loading chamber for reciprocating movement in said loading chamber by an operator.

4,213,491

## PNEUMATIC TIRE CONTAINING WATER-DISPERSIBLE PUNCTURE SEALANT

George A. Pope, and Alan J. Bourne, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England

Filed Aug. 8, 1978, Ser. No. 931,932
Claims priority, application United Kingdom, Aug. 11, 1977, 33692/77
Int. Cl.² B60C 17/00
U.S. Cl. 152—330 L 16 Claims

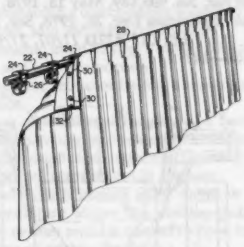
1. A pneumatic tire having on its interior surface a puncture sealant comprising: (a) a polybutene lubricant to facilitate relative movement between contacting portions of said interior surface when the tire is driven in a deflated condition, (b) a non-ionic surfactant and (c) a particulate solid filler.

4,213,492

## DRAPERY ROD CLIP

Gerald E. Guebert, 3039 Eric La., Farmers Branch, Tex. 75234, and Raymond R. Belknap, 125 Star, Austin, Tex. 78734

Filed Oct. 4, 1978, Ser. No. 948,433
Int. Cl.² A47H 1/00
U.S. Cl. 160—124 7 Claims



1. A connector clip for attachment of drapery to a cylindrical support member comprising:
a face portion having front and back surfaces;
fastener means disposed on the front surface of said face portion for detachably coupling with respective fastener means affixed to said drapery;
an upper leg having a first end connected to said face portion, said upper leg extending transversely away from the back of said face portion;
a first curved jaw carried by a second end of said upper leg for engaging said cylindrical support;
a lower leg having a first end connected to said face portion, said lower leg including a curvilinear portion extending tangentially from said face portion to a point spaced from the back surface of said face portion; and
a second curved jaw carried by a second end of said lower leg for engaging said cylindrical support in opposition to said first curved jaw.

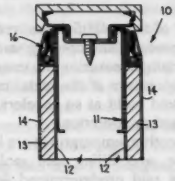
4,213,493

## FABRIC RETAINER FOR PANEL

Richard G. Haworth, Holland, Mich., assignor to Haworth Mfg., Inc., Holland, Mich.

Filed Jan. 24, 1979, Ser. No. 5,955
Int. Cl.² A47G 5/00
U.S. Cl. 160—351 5 Claims

1. In a substantially rectangular space divider panel having a frame member extending longitudinally along each edge thereof, a channel-like fabric retainer fixedly positioned adjacent each exterior side of each said frame member and extending longitudinally thereof, and a thin sheet of flexible fabric extending tautly across each of the exterior side surfaces of said panel, said fabric sheets having the edge portions thereof fixedly secured within the respective retainers, comprising the improvement wherein said retainer includes a channel portion positioned adjacent said frame member and opening outwardly toward the edge of said panel, said channel portion including inner and outer substantially parallel walls joined together by a bottom wall and defining an outwardly opening channel, said outer wall at its free end terminating in a rounded wall which projects inwardly and which terminates in an inner flange projecting inwardly into the channel, said inner flange being disposed between said inner and outer walls and extending at a slight incline relative to said inner and outer walls so that the



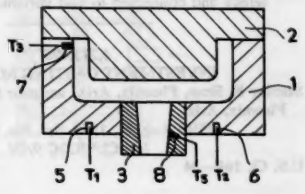
free edge of said flange is disposed closely adjacent said inner wall, the free edge of said flange being spaced a substantial distance from said bottom wall, said fabric sheet extending across said outer wall and wrapping around said rounded wall, said fabric sheet having an edge portion positionedwithin said channel, the edge portion of said fabric sheet including overlying layers which define a fold positioned within said channel in the vicinity of said bottom wall, said overlying layers causing said flange to be resiliently deflected so that said overlying layers are resiliently held between the free edge of said flange and the opposed inner wall.

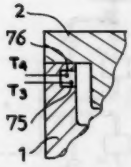
4,213,494

## PROCESS AND APPARATUS FOR LOW PRESSURE CASTING

Henri Carbonnel, Antony, France, assignor to Novatome, Le Plessis Robinson, France

Filed Jun. 13, 1978, Ser. No. 915,209
Claims priority, application France, Jun. 15, 1977, 77 18395
Int. Cl.³ B22D 18/04, 18/08
U.S. Cl. 164—4 8 Claims





1. In a process of low-pressure casting a metal in a mould which is fed with metal from below by means of an electromagnetic pump, the process comprising the following stages,

starting from an initial position in which the metal to be moulded is at a height which is slightly lower than that of the inlet of said mould:

(a) filling said mould with metal, at a predetermined acceleration, by applying an increasing voltage to said pump until a voltage is reached which corresponds to a delivery height which is slightly greater than that of the top of said mould;

(b) holding said voltage until a skin forms on the inner walls of said mould;

(c) applying an increased pressure to the metal in said mould until the solidification front reaches the inlet of said mould; and

(d) at the end of the solidification, reducing the pressure to said initial pressure and opening said mould; the improvement comprising measuring the temperature of said mould and the temperature of the metal in the melting furnace, and filling said mold at an acceleration greater than said predetermined acceleration

when the respective temperatures are lower than a predetermined value, and filling said mold at an acceleration smaller than said predetermined acceleration when the respective temperatures are higher than said predetermined value.

4. A device for controlling the low-pressure casting of a metal in a mould which is fed with metal from below by means of an electromagnetic pump, said device comprising:

means for generating a plurality of supply voltages for an electromagnetic pump;

first, second, third and fourth clock counters with preselection, which are a connected in series sequence to determine the duration of respective casting operations including: mould filling; skin formation on mould wall interior; formation of solidification in mould inlet; opening of said mould; respectively;

an analog switch associated with means for controlling the supply voltage of said pump, and connected to be controlled by output signals from said first, second and third clock counters for selectively applying the corresponding voltages to said pump;

means for controlling the opening of the mould and which is controlled by said fourth clock counter; at least one temperature sensor for said mould and one temperature sensor for the metal in the melting furnace; a variable time base means for said first and second clock counters; and

a reversing amplifier associated with each said temperature sensor and connected to said variable time base means.

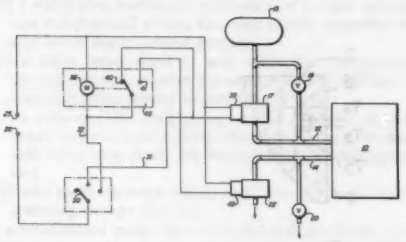
---

**4,213,495**

## INVESTMENT CASTING METHOD

**Stanley E. Rose, Phoenix, Ariz., assignor to Ceram-Dent, Inc., Phoenix, Ariz.**

**Filed Aug. 31, 1978, Ser. No. 938,460**
**Int. Cl.³ B22C 9/04**
**U.S. Cl. 164—34** **10 Claims**



1. A method for burn out of a green investment having an ideal burn out temperature and including a disposable pattern therein, said method comprising the steps of:

(a) heating an oven for receiving the green investment to the ideal burn out temperature;

(b) inserting the green investment within the oven at an ambient pressure;

(c) pressurizing the oven to a first predetermined pressure while maintaining the temperature of the oven at the ideal burn out temperature;

(d) maintaining the oven at the first predetermined pressure and at the ideal burn out temperature for a first predetermined time;

(e) cycling the pressure in the oven between the first predetermined pressure and a second predetermined pressure, which second predetermined pressure is less than the first predetermined pressure by an amount of at least 20 psig, and while maintaining the oven at the ideal burn out temperature for a second predetermined time; and

(f) bringing the pressure within the oven to ambient pressure and removing the investment from the oven.

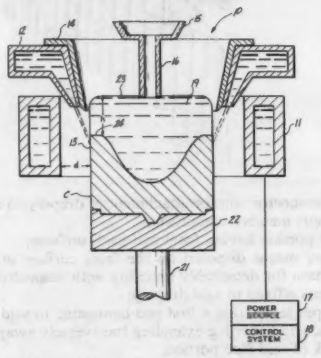
---

**4,213,496**

## ELECTROMAGNETIC CASTING APPARATUS

**John C. Yarwood, Madison; Ik Y. Yun, Orange; Derek E. Tyler, Cheshire, and Peter J. Kindlmann, Northford, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Division of Ser. No. 905,889, May 15, 1978, Pat. No. 4,161,206.**
**This application Dec. 26, 1978, Ser. No. 973,476**
**Int. Cl.² B22D 11/01, 27/02**
**U.S. Cl. 164—147** **29 Claims**




1. In an apparatus for casting metals comprising:

means for electromagnetically containing molten metal and for forming said molten metal into a desired shape, said electromagnetic containing and forming means including: an inductor for applying a magnetic field to said molten metal, said inductor in operation being spaced from said molten metal by a gap extending from the surface of said molten metal to the opposing surface of said inductor;

means for applying an alternating current to said inductor to generate said magnetic field; and

means for minimizing variations in said gap during operation of said casting apparatus, said gap variation minimizing means comprising control circuit means connected to said alternating current application means, said control circuit means including circuit means for sensing variations in said gap and means responsive to said gap variations sensing circuit means for controlling the magnitude of said current applied to said inductor so as to minimize said gap variation; the improvement wherein:

said circuit means for sensing variations in said gap includes means for sensing the current and the voltage in said inductor and for providing signals corresponding thereto and means receiving said sensed current and voltage signals for determining an electrical parameter correspond-

ing about to the inductance of said inductor, which varies with the magnitude of said gap.

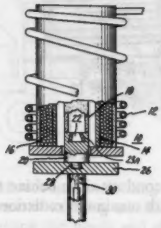
---

**4,213,497**

## METHOD FOR CASTING DIRECTIONALLY SOLIDIFIED ARTICLES

**Thomas F. Sawyer, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 21, 1978, Ser. No. 935,588**
**Int. Cl.[2] B22D *25/06***
**U.S. Cl. 164—60** **4 Claims**



1. a method for producing a directionally solidified cast alloy article in a shell mold, said method comprising:

(a) providing a ceramic mold having a cavity divided into an upper portion and a lower portion,

(b) providing a metallic retractor having a reentrant recess in its upper position,

(c) forming a liner of relatively frangible and heat-resistant thermally-conductive ceramic material in said recess,

(d) assembling the mold and retractor together with the mold cavity and retractor recess in register,

(e) filling said mold with molten alloy metal in a heating zone at a temperature above the melting point of said metal whereby molten metal is caused to flow into and fill the retractor recess within the liner,

(f) moving the assembly downwardly relative to the heating zone to cause cooling and to establish directional solidification of the alloy in said cavity, and

(g) breaking the liner and removing the resulting cast article from the retractor.

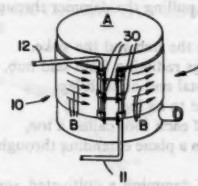
---

**4,213,498**

## LOW-COST FLEXIBLE PLASTIC HEAT EXCHANGER

**Benjamin E. Vandenbossche, Hillsborough, Calif., assignor to American HCP, South San Francisco, Calif.**

**Filed Nov. 15, 1978, Ser. No. 960,829**
**Int. Cl.[2] F28D *1/06***
**U.S. Cl. 165—136** **4 Claims**




1. A heat exchange tank system comprising:

a cylindrical tank having a smooth exterior surface;

at least one modular plastic heat exchanger circumferentially disposed around the outer circumference of said tank, said modular plastic heat exchanger including at least one thermal exchange means composed of parallel inner and outer plastic sheet means separated by a plurality of parallel flat ribs oriented normal to said sheet means and fused to said sheet means to form a plurality of parallel channels;

a first manifold means having a central large flow tube and a distributor means operably connected to said thermal exchange means at one edge so said flow tube is normal to the longitudinal axes of said channels and to fluidly communicate said channels with said flow tube; and a second manifold means having a large central flow tube and a distributor means operably connected to the edge of said thermal exchange means opposite said first manifold means so said flow tube is normal to the axes of said channels and to fluidly communicate said channels with its flow tube, whereby fluids can enter one flow tube and simultaneously pass through said channels of said thermal exchange means to the other flow tube;

clamping means operably connected between said first and second manifold means to tension said thermal exchange means so its inner sheet means is forced tightly against said smooth surface of said tank; and

fitting means connected to said flow tube means to operably communicate them with fluid ingress and egress lines for heating or cooling said tank by pumping the appropriate fluids therethrough.

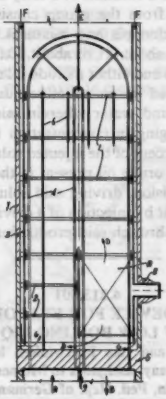
---

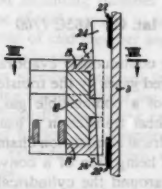
**4,213,499**

## SUPPORTING GRATE FOR TUBE PLATES AND RELATIVE ASSEMBLING IN A STEAM GENERATOR OR THE LIKE

**Franco Straffi, Dresano, Italy, assignor to Breda Termomeccanica S.p.A., Milan, Italy**

**Filed Dec. 19, 1977, Ser. No. 862,184**
**Claims priority, application Italy, Dec. 21, 1976, 30702 A/76**
**Int. Cl.[2] F28F *9/18***
**U.S. Cl. 165—162** **12 Claims**




1. A grate assembly for supporting tubes within a shell of a heat exchanger or steam generator, the assembly comprising:

at least two plates comprising gratings; and

a frame formed of an upper ring, an intermediate ring and a

lower ring fastened together to form a single continuous structure, said rings being arranged at least partially superimposed one on another, said intermediate ring having grooves formed therein for receiving the ends of the gratings, said upper and lower rings being secured to said intermediate ring for enclosing therebetween the ends of the gratings which are arranged in their respective grooves formed in said intermediate ring, said grooves being formed such that at least one of said at least two plates is accommodated therein without any longitudinal clearance in said frame, said at least one of said at least two plates having an end surface, said frame having an inner surface which includes a bearing surface, each respective end surface of said at least one of said at least two plates being shaped so as to coincide with and perfectly adhere to said bearing surface of said inner surface of said frame, whereby said at least one of said at least two plates always acts as a strut.

---

**4,213,500**

## OIL RECOVERY PROCESS: INJECTION OF FATTY ALCOHOL FOLLOWED BY SOAP

**Ricardo L. Cardenas, and Joseph T. Carlin, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Jun. 26, 1978, Ser. No. 918,756**
**Int. Cl.[2] E21B *43/22***
**U.S. Cl. 166—273** **4 Claims**

1. A method of recovering crude oil from a subterranean reservoir having one or more injection means in fluid communication with one or more producing means which comprises injecting into said reservoir through said injection means an effective quantity of a solution of a fatty alcohol wherein the alcohol is selected from the group consisting of n-dodecyl, n-octyl and oleyl alcohols and mixtures thereof ranging in concentration from about 0.1 to about 10.0 weight percent of the injected solution and either a crude oil or a refined fraction of crude oil followed by an effective quantity of a solution comprising a soap and water wherein said soap is a sodium dodecyl sulfate ranging in concentration from about 0.05 to about 5.0 weight percent of the injected solution, said solutions combining with the crude oil present in the reservoir to form an oil-in-water emulsion, driving said solutions and emulsion through the reservoir by injection of a driving fluid and recovering the crude oil through said production means.

---

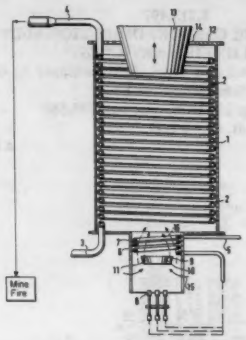
**4,213,501**

## PROCESS AND DEVICE FOR EVAPORATING LARGE QUANTITIES OF LOW BOILING LIQUEFIED GASES

**Ferdinand Pfeiffer, and Leo Rottwinkel, both of Düsseldorf, Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Oct. 25, 1977, Ser. No. 844,596**
**Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651849**
**Int. Cl.[2] A62C *1/00***
**U.S. Cl. 169—46** **10 Claims**

1. In a process for continuously evaporating large amounts of low boiling liquefied gases by the transfer of heat produced by the combustion of a combustible gas, the improvement being effecting the heat transfer in a heater which consists essentially of a cylindrical combustion chamber having a radiation component and being free of a convection component, disposing a passage around the cylindrical combustion, conduction the gas to be evaporated through the passage, exposing the liquefied gas to a burner flame with radiation maximum upon entry into the passage, producing the burner flame with maximum radiation by at least one gas burner operated as a premix burner, utilizing the gas coming out of the nozzle to take up part of the air required for combustion from the room and directing the so-formed primary flame to strike a deflective plate mounted near the entrance to the combustion chamber and sucking the secondary air in behind the deflector plate to produce a flame with maximum radiation.



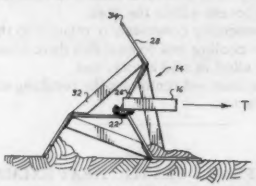

---

**4,213,502**

## SELF TRIPPING DAMMER

**John D. Gibson, Rte. B, Lamesa, Tex. 79331**

**Filed Jun. 25, 1979, Ser. No. 51,705**
**Int. Cl.[3] A01B *35/18***
**U.S. Cl. 172—1** **9 Claims**




1. A self tripping dammer comprising:
a. a hub through the dammer,
b. a yoke extending on each side of the hub forming
c. draft means for pulling the dammer through a cultivated field,
d. an axle through the hub and the yoke,
e. at least three legs radiating from said hub, and
f. a foot on the distal end of each leg,
g. each foot angled to its leg,
h. the distal end of each foot called a toe,
j. each foot lying in a plane extending through the toe of the trailing foot.

9. The method of damming a cultivated agricultural field comprising:
a. towing a three-legged dammer behind a draft vehicle,
b. preventing the dammer from rotating about a central hub by
c. skidding a foot on one of the down legs flat along the earth, and
d. rotating the dammer ⅓ revolution responsive to soil build-up on the feet thereby
e. dropping a dam at each ⅓ revolution.

**4,213,503**

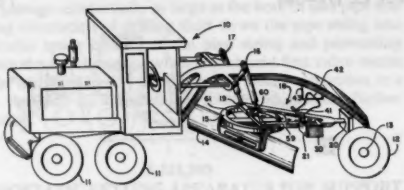
## SLOPE CONTROL SYSTEM

**Dwayne R. Elmberg, Golden Valley, and Royal R. Hawkins, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 548,500, Feb. 10, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,200**

**Int. Cl.[2] E02F 3/76**

**U.S. Cl. 172—4.5** **20 Claims**



1. A control apparatus for controlling the slope of an earth working tool of an earth working machine, said machine having means for adjusting the grade and slope of said tool, the tool having frame means for supporting said tool by said machine and for allowing rotation of said tool with respect to said frame means, said apparatus comprising:

housing means adapted to be fixedly secured to said frame means;

slope sensor means within said housing means for sensing the slope of said tool;

first means adapted to be responsive to rotation of said tool, about an axis substantially perpendicular to said frame means, and connected to said slope sensor means for providing a correction factor to said slope sensor means dependent upon the rotation of said tool; and,

second means adapted to be responsive to deviations of said tool from an axis parallel to the line of flight of said machine and connected to said slope sensor means for maintaining said slope sensor means substantially parallel to the line of flight of said machine,

whereby said apparatus is arranged to allow for substantially 90° rotation of said tool about the longitudinal axis of the machine without damage to said apparatus.

---

**4,213,504**

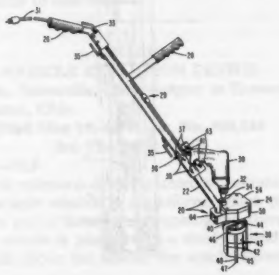
## ROTARY, HAND-HELD APPARATUS FOR PERFORMING VARIOUS SOIL WORKING OPERATIONS

**Fred A. Schneider, 841 Mohican Way, Redwood City, Calif. 94062**

**Filed Nov. 7, 1977, Ser. No. 849,088**

**Int. Cl.[2] A01B 1/00, 33/06**

**U.S. Cl. 172—25** **16 Claims**



7. A soil working assembly and a torque producing output shaft adapted for rotating said assembly by a power means, said assembly comprising;

a guide rod demountably secured coaxially to the output shaft for rotation therewith about an axis substantially normal to the soil surface, said guide rod having an internally threaded hub means integral with the mounting end thereof, with the depending end being formed at a selected angle to define a soil boring tip;

a soil engaging member formed of a flat length of metal to define a support base from which depends at least a pair of tines, each having a tip at the ends thereof, with the guide rod extending axially therebetween beyond the tine tips and rotatable about the same axis;

wherein the flat tines are disposed with a sharpened leading edge and a trailing edge, the tips of the tines being formed at an angle to their direction of motion with the leading edges being longer than the trailing edges thereof;

a reinforcing member secured to the pair of tines immediately below the support base to strengthen the assembly against torsional forces produced by contact of the tines with the soil; and

the assembly further including, said support base having a square hole formed therein, a square shank formed along an end portion of the output shaft, a shoulder formed in the output shaft and terminating the square shank, threads formed along the end of the output shaft, wherein the square hole of the support base fits over the square shank, and the soil engaging member is demountably secured to the output shaft for positive rotation therewith by threading the hub means onto the threaded end of the output shaft to confine the soil engaging member therebetween.

---

**4,213,505**

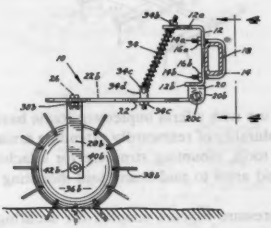
## TRACTOR IMPLEMENT CARRYING APPARATUS

**Glenn L. Jolley, Route 2, Box 121, Hutchinson, Minn. 55350**

**Filed Aug. 14, 1978, Ser. No. 933,154**

**Int. Cl.[2] A01B 39/26, 39/28**

**U.S. Cl. 172—510** **1 Claim**



1. A tractor implement carrying apparatus for attachment to a tractor tool bar comprising:

(a) a first U-shaped mounting member having means for clamping the base of said member to said tractor tool bar and having the legs of said member angled rearwardly in substantial vertical alignment;

(b) bushing support member attached transversely to said U-shaped mounting member lower leg, said support member having downwardly projecting end tabs with holes therethrough and having an elongated pin of predetermined diameter extending between said end tabs and through said holes;

(c) drawbar having a first curled end pivotally attached to said pin between said end tabs and having a second slotted end extending rearwardly thereof;

(d) at least one bushing mounting on said pin adjacent said drawbar and between said end tabs;

(e) a threaded rod having one end protruding through the upper leg of said U-shaped mounting member and having the other end pivotally attached to said drawbar, and a

compression spring mounted about said rod between said upper leg and said pivotal attachment;

(f) an implement attaching bracket transversely bolted to said drawbar through said slotted end, said bracket having extensible and retractable horizontal arms with downwardly extending ends, each of said ends having an implement attachment hole therein; and

(g) concave rolling shields rotatably attached to said implement attaching bracket through said implement attaching hole, said shields mounted with the concave portions in facing relationship.

---

**4,213,506**

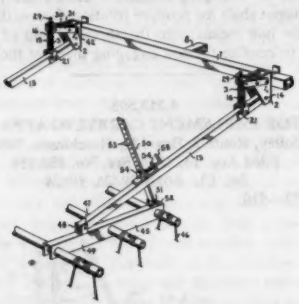
**DRAG HARROW PRESSURE ADJUSTING DEVICE**

**Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Co., Inc., Tipton, Kans.**

**Filed Nov. 17, 1978, Ser. No. 961,622**

**Int. Cl.[2] A01B *19/08***

**U.S. Cl. 172—624** **3 Claims**



1. For use with a farm implement frame having a transverse beam, a plurality of rearwardly extending arms supporting soil finishing tools, mounting structure for attaching the forward end of said arms to said beam, said mounting structure comprising:

(a) a pressure bracket adapted for securing to said beam, hinge means pivotally supporting said arm forward end to said bracket for frame arm vertical arcuate movement,

(b) spring structure associated with said bracket and including a compression spring having a lower end operably bearing against said arm rearwardly of said hinge means,

(c) link means mounted on said bracket, said compression spring having an upper end bearing against said link means,

(d) adjusting means associated with said link means and said bracket, said adjusting means selectively retaining said link means in predetermined alternate positions whereby the bearing pressure of said spring against said arm is selectively altered,

(e) said link means being pivotally mounted on said bracket intermediate the ends of said link means,

(f) one of said link means ends receiving the force of said spring, and

(g) a locking member associated with said bracket, the other of said link means ends receiving said locking member, said link means other end and said locking member comprising said adjusting means.

**4,213,507**

**GRADING VEHICLE**

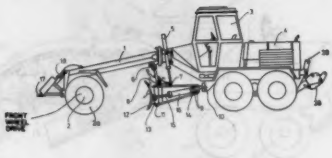
**Erwin Horrer, Michael Steinherrstrasse 27, and Gustav Leidinger, Michael Steinherrstrasse 16, both of Friedberg, Fed. Rep. of Germany (8904)**

**Filed Oct. 25, 1977, Ser. No. 844,593**

**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 7633233[U]; Feb. 18, 1977, 2707006**

**Int. Cl.[2] E02F *3/76***

**U.S. Cl. 172—784** **7 Claims**



1. An improved grading vehicle comprising:

a rear vehicle section which has a rear axle and an engine;

a front bridging vehicle chassis, one end of which is connected to the rear vehicle section, said chassis being of substantially smaller cross-section than the rear vehicle section where joined;

front wheels mounted on the other end of said chassis;

control equipment mounted on said chassis;

a grading device suspended from said equipment so as to be mounted between the front wheels and the rear section of the vehicle,

said equipment acting to adjust said grading device in all directions,

said wheels being driven; and

a universal joint for supporting the grading device which is mounted directly to the rear section at a location on said rear section spaced below where the chassis is connected to said rear section to trasmit thrust between said grading device and said rear section without tending substantially to raise the bridging chassis without simultaneous raising of the engine.

---

**4,213,508**

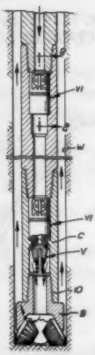
**DOWNHOLE FIRE CONTROL**

**John E. Tschirky, Long Beach, Calif., and Wayne M. Sullivan, Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.**

**Filed Oct. 3, 1977, Ser. No. 838,890**

**Int. Cl.[2] E21B *25/00***

**U.S. Cl. 175—235** **4 Claims**



1. Downhole fire control apparatus for drilling wells in earth formation using air as the drilling fluid, comprising: a tubular

pipe string having a bit at its lower end rotatable to drill through the earth during circulation of drilling fluid through the bore of the pipe string and the bit and upwardly in the annulus outside the pipe string; first normally open valve means in the pipe string adjacent the bit for normally allowing circulation of drilling fluid down the pipe string into the annular space outside of the pipe string and preventing reverse flow and flow into the annular space when closed; and additional normally open valve means spaced upwardly in the pipe string from the first valve means; said additional valve means having a flow passage substantially as large as the bore of said pipe and allowing circulation of drilling fluid down the pipe string into the annular space outside of the pipe string and preventing flow into the annular space when closed; said first valve means and said additional valve means having means responsive to a fire in the well to automatically close and prevent further circulation.

---

**4,213,509**

## HYDROSTATIC SETTING APPARATUS FOR SUPPORT OF LOADS

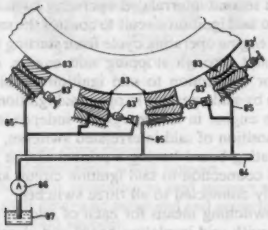
**Hans W. Häfner, Köhlenthal, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany**

**Filed Dec. 20, 1978, Ser. No. 971,542**

**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758340**

**Int. Cl.[2] G01G *21/02*; F15B *15/02***

**U.S. Cl. 177—199** **4 Claims**



1. A fluid load measuring apparatus which is suited in particular for measuring the load on a body using fluid bearings supporting the body whose load is to be measured, comprising, several individual fluid bearing elements in contact with said body, and each bearing element including a wedge key and upper and lower mating elements which are movably mounted on a fluid film which is supplied under pressure between the sliding surfaces of said key and said mating surfaces, fluid supply means connected to all of said fluid bearing elements to apply fluid at a common pressure to all of said bearing elements, and a plurality of load measuring means respectively connected to said plurality of fluid bearing elements such that the sum of the loads measured by said load measuring means is equal to the load of said body.

---

**4,213,510**

## ARTICLE RETENTION DEVICE

**John E. Wible, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio**

**Filed May 11, 1978, Ser. No. 904,844**

**Int. Cl.[2] B60R *18/02***

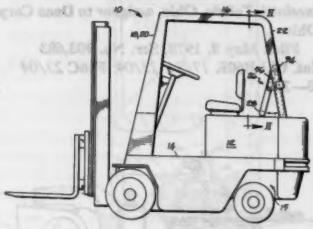
**U.S. Cl. 180—68.5** **14 Claims**

1. An article retention device adapted to restrain the movement of an article relative to a platform, which platform includes a base and a frame means upstanding therefrom, and wherein the article is positioned on the base and the frame means extends above the article; the article retention device comprising:

restraining means for restraining the movement of the article, said restraining means selectively positionable to a first position to restrain the article and to a second position to release the article; and

mounting means adapted for mounting the restraining means to the platform frame means at a position on the frame means generally above the article, the restraining means dependent downwardly from said mounting means; and

wherein the restraining means includes a lower portion; and



wherein said mounting means includes aperture means for facilitating both pivotal and translational motion of at least the lower portion of the restraining means between the first and second positions, such that at least the lower portion of the restraining means is retractably movable upwardly as the restraining means is moved to the second position to release the article.

---

**4,213,511**

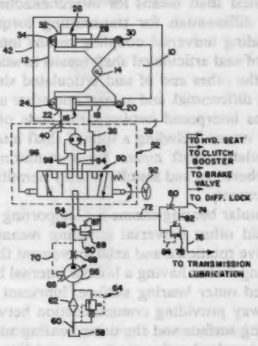
## CONSTANT FLOW HYDRAULIC SYSTEM

**Raymond D. Rubenstein, La Grange Park, and Charles L. Rescorla, Westmont, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Filed Jan. 22, 1979, Ser. No. 5,402**

**Int. Cl.[3] B62D *5/06***

**U.S. Cl. 180—139** **2 Claims**




1. A constant flow hydraulic system for a tractor having an engine, said hydraulic system comprising:

a variable displacement pump driven by the engine and having a compensator for adjusting pump displacement to provide a relatively constant predetermined flow as engine speed varies;

an open-center hydrostatic steering system connected to receive said flow;

hydraulically-actuated apparatus connected in series with and downstream of said steering system;

a relief valve connected to bypass said steering system so that said apparatus will receive pump flow under conditions in which said steering system would normally substantially reduce the flow thereto;

said hydraulic apparatus being arranged in a preferred branch and a secondary branch; and

a flow divider valve upstream of said branches and downstream of said steering circuit and said relief valve for assuring adequate flow to said preferred branch.

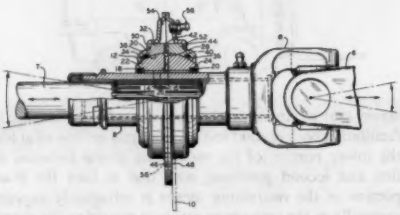
---

**4,213,512**

## POWER SHAFT SUPPORT BEARING

**Philip J. Mazziotti, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio**

**Filed May 8, 1978, Ser. No. 903,683**
**Int. Cl.[2] B60K *17/34, 23/04;* F16C *23/04***
**U.S. Cl. 180—233** **1 Claim**



1. A drive system for a vehicle having front and rear drive wheels, including:

a rear differential for transmitting torque to the rear drive wheels;

shaft means for introducing torque to said rear differential including universal coupling means interconnecting one end of said shaft means to the output of a power source and the other end of said shaft means to said rear differential;

a front differential for transmitting torque to the front drive wheels;

articulated shaft means for interconnecting said front and rear differentials for transmitting torque therebetween, including universal coupling means interconnecting one end of said articulated shaft means to said rear differential and the other end of said articulated shaft means to said front differential, and at least one other universal coupling means interposed between the ends of said articulated shaft means including a splined shaft interconnecting said articulated shaft means for transmitting rotary motion therebetween and simultaneously permitting relative axial movement;

first annular bearing means for supporting the splined shaft of said other universal coupling means to provide for relative rotational and axial movement therebetween, said bearing means having a hollow internal bearing surface, a curved outer bearing surface, lubricant conducting passageway providing communication between the internal bearing surface and the outer bearing surface thereof;

second annular bearing means surrounding said first bearing means and enabling relative pivotal movement therebetween, said bearing means having an internal bearing surface contoured to conform with the curved outer surface, and lubricant conducting passageway providing communication between the internal bearing surface and the outer surface thereof communicating with the lubricant passageway of said first bearing means;

seal means for retaining a lubricant between the curved outer bearing surface of said first bearing means and the curved inner surface of said second bearing means; and

a mounting bracket circumscribing the outer surface of said second annular bearing means, said mounting bracket having an internal lubricant reservoir communicating with the lubricant passageways of said first and second bearing means.

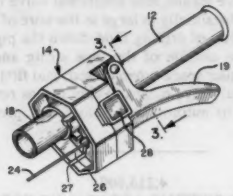
---

**4,213,513**

## IGNITION CONTROL SYSTEM WITH SAFETY SWITCHES

**Frederick R. Beck, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.**

**Filed Jun. 26, 1978, Ser. No. 918,941**
**Int. Cl.[2] B60K *28/00***
**U.S. Cl. 180—272** **19 Claims**



1. A control system for an internal combustion engine having a carburetor and an ignition circuit for normal control by an operator of said engine through a closed ignition circuit and said carburetor and for also stopping said engine by opening said ignition circuit in an emergency when said operator loses control of the operation of said control system and hence the engine, including the combination of

(a) first and second interrelated operating switches for connection to said ignition circuit to control the same through a normal engine operating cycle from starting through full running and through stopping said engine, and a third switch for connection to said ignition circuit solely for actuation by said operator to open said ignition circuit and stop such engine in an emergency independently of the control position of said interrelated switches;

(b) an insulating board having a printed circuit thereon for electrical connection to said ignition circuit and which is electrically connected to all three switches;

(c) circuit switching means for each of said three switches mounted with said insulating board and electrically connecting and disconnecting each switching means relative to said printed circuit;

(d) a housing member mounting said insulating board therein with said three switches supported on said insulating board;

(e) button means on the outside of said housing having connecting means to said third switch within said housing, for operating said third switch;

(f) a throttle lever member having a spring tension exerted thereon operatively connected to said carburetor and to said first and said second switches;

(g) means for mounting said throttle lever member on the outside of said housing member including a slot in one of said members and a pin in the other member for relative pivotal and transverse movement between said pin and said slot and corresponding pivotal and transverse movement of said throttle lever member at one end portion thereof in the course of a said engine operating cycle, and said throttle lever member having a hand grip portion at the opposite end portion thereof with the latter portion being movable away from and toward an outside surface of said housing member;

(h) said throttle lever member having a bump at said opposite end portion thereof engaging said housing member outside surface as a pivot point for said throttle lever member in an initial movement thereof and thereby causing relative transverse and pivotal movement of said pin and slot to correspondingly move said one end portion of said throttle lever member, and said latter member having a projection thereon extending into said housing member for operative connection with said second switch to close the same, said throttle lever member also acting to close said first switch sequentially relative to said first switch

during said pivotal movement of said one end portion and a corresponding transverse movement thereof;

(i) means in said second switch to open the same after said first switch is closed; and

(j) said throttle lever member and said button means both being positioned so as to be available to the hand and the fingers of an operator of the engine to permit ready and selective operation of said three switches.

---

**4,213,514**

## HYDRAULIC WHEEL DRIVE WITH CLUTCH

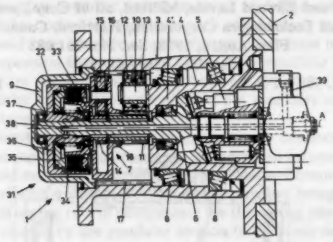
**Friedrich Ehrlinger; Egon Mann; Manfred Fischer, all of Friedrichshafen, and Rudolf Jocham, Langenargen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany**

**Filed Oct. 3, 1978, Ser. No. 948,234**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744977**

**Int. Cl.² B60K *17/14***

**U.S. Cl. 180—308** **9 Claims**



1. A wheel drive comprising:

a generally nonrotatable wheel support;

a hydraulic motor mounting on said support and having an output shaft having an outer end and extending outwardly away from said support;

a wheel hub surrounding said shaft, rotatable on said support about a wheel axis, and having an open side turned outwardly away from said wheel support;

a clutch mounted in said wheel hub and having a first clutch member connected to said outer end of said output shaft and a second clutch member lying between said first member and said nonrotatable wheel support;

a cover plate covering said open side of said wheel hub and removable to give access to said clutch; and

a planetary-gear transmission between said clutch and said motor and having an input gear connected to said second clutch member and an output gear rotationally fixed on said hub.

---

**4,213,515**

## SPEAKER SYSTEM

**Robert R. Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands**

**Filed Sep. 12, 1978, Ser. No. 941,743**

**Claims priority, application Netherlands, Sep. 15, 1977, 7710136**

**Int. Cl.² H05K *5/00***

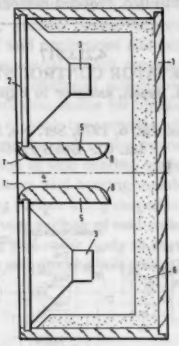
**U.S. Cl. 181—145** **2 Claims**

1. A bass reflex speaker system comprising:

a housing having a front wall, a rear wall and spaced apart side walls;

a pair of spaced apart speakers mounted on said housing front wall; and

a duct defining means mounted on said housing front wall to be positioned between said speakers, said duct defining means including a top wall and a bottom wall, said walls being essentially parallel and spaced apart, said walls each having a front end mounted in said housing front wall and a rear end spaced from said housing rear wall, said duct walls extending essentially the entire distance between said housing side walls, said duct top wall having front and rear end edges which are each curved upwardly and said bottom wall having front and rear edges which are each curved downwardly so that a duct formed by said



duct defining means has a cross-sectional dimension at the ends thereof which exceeds the cross-sectional dimension at the central portion of said duct and said cross-sectional dimension varies symmetrically from one end of said duct to the other end of said duct, whereby spurious side effects are minimized.

---

**4,213,516**

## ACOUSTICAL WALL PANEL

**James E. Sulewsky, Mendham, N.J., assignor to American Seating Company, Grand Rapids, Mich.**

**Filed Nov. 29, 1978, Ser. No. 964,675**

**Int. Cl.² E04B *1/82***

**U.S. Cl. 181—286** **7 Claims**

1. An acoustical panel comprising: a core material formed of a plurality of stratified layers of glass fiber pressed together under heat and pressure to form a board having a front surface and a rear surface, the average density of each layer increasing from said front surface to said rear surface and being in the range of approximately two-six pounds per cubic foot respectively, said front surface defining a plurality of cavities extending partially inwardly of said front surface and having outwardly flared side walls, the center-to-center spacing of said cavities being selected to correspond to the quarter wave length of sound in the intelligibility range of human speech and being spaced substantially entirely throughout said front surface, said cavities being individually sized to absorb sound at the intelligibility range of speech, the front stratified layer extending into and lining the side walls of said cavities to enhance absorption of sound at higher frequencies in the intelligibility range and being rounded to increase surface area and

to increase sound absorption at flanking angles of incidence; a septum covering the rear surface of said core; and a permeable membrane covering the front surface of said core and extending over said cavities to permit sound pressure waves to enter and be trapped in said cavities; said panel characterized in having its minimum sound absorption at frequencies less than about 400 cycles per second to absorb sound at such low frequencies in a controlled, reduced manner.

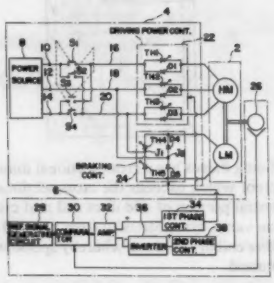
---

**4,213,517**

## ELEVATOR CONTROL SYSTEM

**Koji Ando, Itami, Japan, assignor to Fujitec Co., Ltd., Osaka, Japan**

**Filed Jul. 6, 1978, Ser. No. 922,430**
**Int. Cl.[2] B66B 1/30**
**U.S. Cl. 187—29 R** **13 Claims**




1. An elevator control system for controlling the speed of an elevator car comprising:

a power supply means for supplying AC power;

a first gate means connected to said power supply means having power controlling elements and a first control input for supplying controlled AC power according to the phase of the signal applied to said first control input;

a driving means connected to said first gate means for driving the elevator car according to the AC power supplied by said first gate means;

a second gate means connected to said power supply means having power controlling elements and a second control input for supplying controlled DC power according to the phase of the signal applied to said second control input;

a braking means connected to said second gate means for dynamically braking the elevator car according to the DC power supplied by said second gate means;

a speed detecting means for detecting the instantaneous speed of the elevator car and for generating an actual speed signal indicative of the detected instantaneous speed;

a reference signal generating means for generating a reference signal indicative of the ideal speed of the elevator car;

a comparator means connected to said speed detecting means and said reference signal generating means for comparing said actual speed signal with said reference signal, for generating a positive signal having a voltage indicative of the difference between said reference signal and said actual speed signal when said reference signal is greater than said actual speed signal, and for generating a negative signal having a voltage indicative of the difference between said actual speed signal and said reference signal when said actual speed signal is greater than said reference signal;

an amplifier means connected to said comparator means for amplifying said positive signal and said negative signal generated by said comparator means;

a first phase controller means connected to said first gate means and said amplifier means for applying a first pulsating signal to said first control input of said first gate means having a frequency equal to the frequency of the AC power supplied by said power supplying means and a phase according to the voltage of said positive signal;

an inverter means connected to said amplifier means for inverting and amplifying said negative signal for generating an inverted positive signal; and

a second phase controller means connected to said second gate means and said inverter means for applying a second pulsating signal to said second control input of said second gate means having a frequency equal to the frequency of the AC power supplied by said power supplying means and a phase according to the voltage of said inverted positive signal.

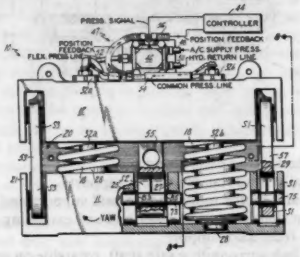
---

**4,213,518**

## FIXED POSITION PENDULAR-TYPE VIBRATION ABSORBER WITH LINEARIZATION AT FIXED OR VARIABLE FREQUENCIES

**Paul W. von Hardenberg, Southbury; Kenneth C. Mard, Stratford, and Edward Lavoie, Milford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Aug. 4, 1978, Ser. No. 931,083**
**Int. Cl.[2] F16D 63/00**
**U.S. Cl. 188—1 B** **12 Claims**




1. A vibration absorber adapted to be fixedly attached to a fixed vibration prone system to cooperate with the principal vibration excitation source to control system vibrations and comprising:

(1) a one-piece base member having a flat platform extending longitudinally thereof and adapted to be fixedly attached to the vibration prone system, and further having three parallel plate members extending laterally thereof and perpendicularly from said platform, with the plate members extending laterally in the direction of desired vibration absorber motion, and wherein the centrally positioned plate member is of substantially different height than the two end plate members which are of equal height, each of said plate members having two equally laterally spaced, equal diameter apertures extending therethrough so that the aperture axes are perpendicular to the plate members and with the apertures in the end plate members being of identical height above the platform and with the apertures in the middle plate member being of considerably different height to the platform but of equal height thereabove so that the apertures form two laterally spaced, parallel sets of three apertures, with the apertures in each set having parallel axes which are also parallel to but equidistant laterally spaced from the parallel axes in the other set of apertures, and so that the apertures in each set define the corners of a triangle so as to be offset in two perpendicular coplanar directions, and so that the apertures in each plate member are positioned in an I-shaped portion of the plate member including two parallel beams passing above and below the apertures and a connecting

structural web connecting said parallel beams between the apertures,

(2) two identical mass members of equal mass, and extending longitudinally along and positioned on opposite lateral sides of said base member and shaped to define plate members extending parallel to and positioned with selective longitudinal spacing on opposite sides of each of said base member plate members so that each mass member defines three longitudinally spaced sets of longitudinally spaced plate members and with each mass member set of plate members positioned on opposite sides of a base member plate member and with selected longitudinal spacing therebetween, each mass member plate member including an aperture of selected diameter equal to the platform plate member apertures diameter and overlapping and having an axis parallel to the axis of the base member plate member aperture which it overlaps, and with the apertures of said mass member plate member sets being coaxial,

(3) a pin member of circular cross section extending through each of the six sets of overlapping apertures defined by said platform plate members apertures and said mass means plate member apertures so as to define a trifiliar, pendular connection between each of said mass members and said base member so as to support each mass member in suspension from said base member for pendular motion in an arc parallel to said plate members due to the trifiliar pendular connection between said pin members and said overlapping aperture sets,

(4) at least one spring member operatively connected between said two mass members to impose an internal force on said mass members to establish the natural frequency of the vibration absorber, said spring member being of selected spring rate to compensate for the spring rate reduction caused by the pendular motion of the mass members with respect to the base member and thereby provide an essentially linear spring rate reacted on the two mass members for angles of pendular motion of at least ±45°, so that the natural frequency of the vibration absorber is substantially constant throughout this range of operation.

---

**4,213,519**

## DISC BRAKE, ESPECIALLY FOR MOTOR VEHICLES

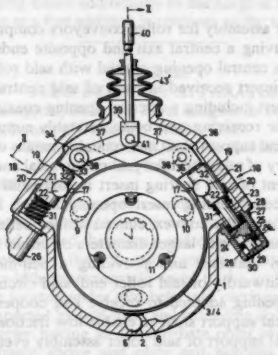
**Gottfried Moser, and Wilhelm Jansen, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Jan. 9, 1978, Ser. No. 867,766**

**Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700669**

**Int. Cl.² F16D 55/04**

**U.S. Cl. 188—71.4** **12 Claims**



1. A disc brake, especially for motor vehicles, which includes: a brake housing, a pair of pressure disc means arranged in said braking housing, actuating means associated with said pressure disc means for turning said pressure disc means angularly in opposite directions with regard to each other for pressing a rotatable brake disc on each side of said pressure disc means against associated braking surfaces, each pressure disc means having at least three projections distributed over the circumference of said pressure disc means for guiding said pressure disc means, guiding means respectively associated with at least some of said projections and including a guiding member adjustable tangentially with regard to the pertaining pressure disc means, an abutment means respectively associated with said pressure disc means for limiting turning movement thereof, each of said tangentially adjustable guiding members includes a guiding bolt with a bearing surface, and a bearing member nested in said bearing surface and engaging the pertaining projection, said bearing member being a roller body, and said bearing surface being shaped in conformity with the contour of the outer surface of said roller body and only partially surrounding said roller body so that a portion of the latter protrudes from said guiding bolt and engages the pertaining projection.

---

**4,213,520**

## ARTISTS' PORTFOLIO

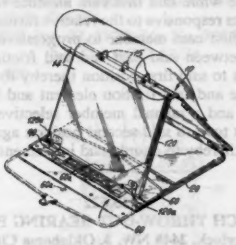
**Abraham Sarna, 15, Bushey Ave., Woodford, Essex, and David Sarna, 27, The Risings, London E. 17, both of England**

**Filed Feb. 26, 1979, Ser. No. 15,342**

**Claims priority, application United Kingdom, Mar. 3, 1978, 8561/78**

**Int. Cl.² A45C 11/00**

**U.S. Cl. 190—16** **9 Claims**

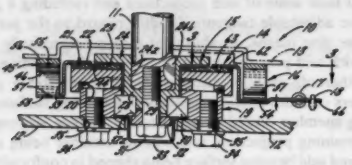


1. An improved artists' portfolio comprising two outer covers joined so as to open and close book-fashion to form a case, co-operating closure means on adjacent free sides of each cover characterised in that the side of one cover opposite to the side thereof joined to the other cover includes a spine with securing means for sheet material and a flat rigid support connected to said spine which may be swung from a position lying between the covers when the case is closed to a position in which a free side of the support bears on or near the side of the other cover opposite to the side thereof joined to the one cover, whereby a triangular structure is formed with the sheet material to lie against either said support or the one cover, a closure means for securing together the sides of the covers opposite to the joined sides said closure means comprising a flap on the other cover with a fastening means engageable with means provided on the one cover.

## 4,213,521
## CLUTCH-BRAKE ASSEMBLY FOR ROTARY IMPLEMENTS

Charles W. Modersohn, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Continuation-in-part of Ser. No. 655,753, Feb. 6, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,417
Int. Cl.[2] F16D *67/02*; A01D *69/08*
U.S. Cl. 192—18 R 14 Claims

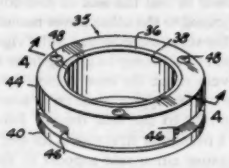


1. In an assembly for driving a rotary implement carried and driven by a power rotated shaft, the combination of, an annular friction element adapted to be fixed to said shaft to rotate therewith, a first annular cam member coaxial with and rotatable relative to said shaft, said cam member having a friction surface opposing said friction element and axially movable to bring the friction surface into engagement with the friction element whereby said cam member rotates with said shaft, a second cam member mounted to rotate relative to said shaft and adapted to carry a rotary implement, means holding said second cam member against axial movement relative to said shaft, opposed inclined cam surfaces formed on said first and second cam members and normally engaging each other when said first cam member is rotating whereby the two cam members rotate together, resilient means acting on said first cam member and urging the latter axially in a direction to engage said friction element, an actuator having a part acting on said first cam member, said part being movable between a first position in which it engages said friction surface and is operable to move said friction surface out of engagement with said friction element and a second position in which said surface and said element are permitted to engage, a spring urging said part toward said first position and into engagement with said friction surface while said first cam member turns relative to said part, means responsive to the relative turning between said part and said first cam member to progressively increase the engagement between said part and said friction surface and move said part to said first position thereby to disengage said friction surface and said friction element and brake said first cam member, and a manual member selectively operable to move said part toward said second position against the action of said spring thereby to couple said implement and said shaft.

## 4,213,522
## CLUTCH THROW-OUT BEARING PLATE

Tommey J. Blaylock, 2448 NW. 3, Oklahoma City, Okla. 73107

Continuation-in-part of Ser. No. 799,448, May 23, 1977, Pat. No. 4,114,744. This application Jan. 17, 1978, Ser. No. 870,158
Int. Cl.[2] F16D *23/14*
U.S. Cl. 192—98 1 Claim



1. In a vehicle clutch assembly having a flywheel and a clutch pressure plate movable toward and away from the flywheel by a plurality of radially inwardly projecting clutch release fingers, a transmission input shaft connecting the clutch pressure plate with a transmission and having a clutch throw-out bearing coaxially mounted on the shaft and movable toward and away from the inwardly directed end portions of said clutch release fingers, the improvement comprising:

a generally cylindrical centrally bored bearing plate supported by said clutch release fingers and comprising a sleeve having an outstanding flange at one end diametrically substantially equal with the diameter of said throw-out bearing and having external threads adjacent its other end loosely

surrounding said transmission input shaft and interposed between said throw-out bearing and said clutch pressure plate with the flange contacting the end portion surface of said clutch release fingers opposite said throw-out bearing;

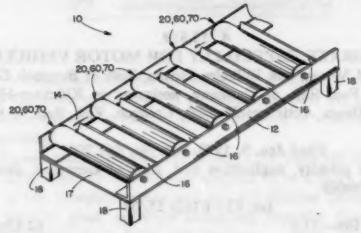
a ring diametrically equal with said flange threadedly engaged with said sleeve, said ring having a plurality of equally spaced radially disposed recesses formed in its surface facing said flange forming, in combination with said sleeve and said flange, a like plurality of radially open sockets nesting the adjacent end portion of the respective said clutch release finger; and,

at lease one bolt extending through said ring and said flange for preventing angular rotation of said ring relative to said sleeve.

## 4,213,523
## CONVEYOR ROLLER ASSEMBLY

Charles C. Frost, Ada, and Siegfried K. Weis, Byron Center, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Sep. 11, 1978, Ser. No. 941,176
Int. Cl.[2] B65G *39/09*
U.S. Cl. 193—37 24 Claims



1. A roller assembly for roller conveyors comprising:

a roller having a central axis and opposite ends, each end having a central opening coaxial with said roller;

a bearing insert received in each of said central openings, each insert including a circular opening coaxial with said roller for receiving and being rotatably supported by a cylindrical support shaft and retaining means on the outer periphery of said insert for preventing axial and rotational movement of said bearing insert in said central opening, said circular bearing insert opening having an annular, radially inwardly convex, curved surface defining a minimum diameter and larger diameters on either side of said minimum diameter and providing a bell-mouth shape facing outwardly of said roller end, said circular bearing insert opening adapted to receive and cooperate with a cylindrical support shaft to enable low friction, low drag rotational support of said roller assembly even when deflected under load in operation;

a bottom wall in at least one of said roller central opening and said bearing insert opening at each end of said roller

for closing the roller assembly and providing a thrust resisting surface.

---

**4,213,524**

## AUTOMATIC VENDING MACHINE WITH LOTTERY BONUS

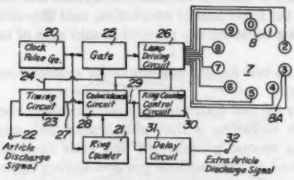
**Toshio Miyashita, Tokyo; Yoshizo Fujii, Nishinomiya, and Takeshi Sawabe, Urawa, all of Japan, assignors to Shinko Automatic Device Co., Ltd., Yashio, Japan**

**Filed Jul. 21, 1978, Ser. No. 926,603**

**Claims priority, application Japan, Jul. 23, 1977, 52-98653; Nov. 24, 1977, 52-157690; Dec. 16, 1977, 52-170258; Jun. 6, 1978, 53-67244**

**Int. Cl.² G07F *11/00***

**U.S. Cl. 194—2** **15 Claims**




1. An automatic vending machine comprising:

a housing including a front panel;

means provided in the front panel for displaying at least one article available for users;

means provided in the front panel for receiving coins and/or bills;

stocker means provided in the housing for storing the articles available for users;

means for discharging at least one article stored in the stocker means in response to an article discharge signal through a discharge opening provided in the front panel;

a plurality of lamps arranged geometrically on the front panel and provided with covers having numbers applied thereto; and

a lamp control circuit for lighting on and off said lamps successively and repeatedly in response to a signal which is generated each time the vending operation is effected, a repetition period of the lighting on and off being such that a light spot appears to move along said geometrical lamp arrangement, wherein said lamp control circuit further comprises a lottery circuit for producing a winning signal in response to a signal generated by the vending operation of the machine to stop the light spot at a predetermined lamp having a lucky number applied thereto and the machine further comprises means to drive said article discharging means additionally to discharge at least one extra article as a free addition in response to the winning signal.

---

**4,213,525**

## FEED DELIVERY APPARATUS

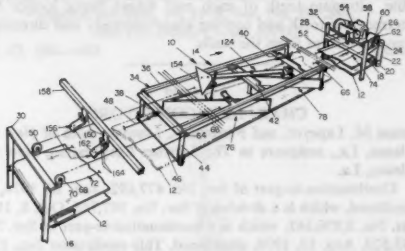
**Lyle W. Scheppele, Dubuque, Iowa, assignor to Toledo Stamping & Manufacturing Company, Toledo, Ohio**

**Filed Mar. 6, 1978, Ser. No. 883,498**

**Int. Cl.² B65G *47/34***

**U.S. Cl. 198—364** **2 Claims**

2. Feed delivery apparatus comprising a belt for carrying animal feed, a carriage positioned relative to said belt to contact feed carried therealong and effective to discharge the feed transversely thereof, said carriage comprising a plate having a width approximately equal to the width of said belt and being located under said belt, said carriage also having a frame supported by said plate and extending above said belt, a front diverter having an intermediate point pivotally carried by said frame above said plate and movable between two positions, in one of which said diverter extends obliquely across the width of said belt in one direction to discharge feed off one side of said belt and in the other of which said diverter extends obliquely across the width of said belt in another direction to discharge feed off the other side of said belt, a deflector having an intermediate point pivotally carried by said frame above said plate behind said diverter and movable between two positions, in one of which said deflector extends obliquely across the width of said belt in one direction to discharge the feed off one side of said belt and in the other of which said deflector extends obliquely across the width of said belt in another direction to carry feed off the other side of said



belt, means for moving said carriage back and forth over a substantial portion of the length of said belt, and mechanical means having a middle point pivotally carried by said carriage, having one end portion pivotally connected to said diverter at a portion spaced in front of its intermediate pivot point, and having a second end portion pivotally connected through a tang to said deflector to substantially simultaneously move said diverter and said deflector in opposite pivotal directions from the oblique positions in which feed is discharged off said one side of said belt to the oblique positions in which feed is discharged off said other side of said belt.

---

**4,213,526**

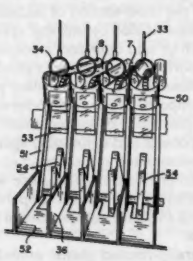
## APPARATUS FOR UNSCRAMBLING AND ERECTING A PLURALITY OF NON-VERTICAL BOTTLES

**Robert H. Graham, Spokane, and Barry D. Campbell, Nine Mile Falls, both of Wash., assignors to The Molson Companies Limited, Rexdale, Canada**

**Filed Jun. 22, 1978, Ser. No. 918,086**

**Int. Cl.² B65G *47/24***

**U.S. Cl. 198—400** **2 Claims**



1. In apparatus for unscrambling and erecting a plurality of non-vertical bottles including a conveying table, a bottle erecting station located adjacent the terminal end of the conveying table, a plurality of bottle stalls at a lower level than said terminal end, pivotal bottle support means located at said station and struck by the bottoms of non-vertical bottles presented bottom-first to said terminal end and which support means are thereby pivoted out of the path of travel of such bottles to enable the latter to fall bottoms-first from said end, said pivotal means also serving to support the necks of non-vertical bottles presented neck first to said terminal end until

said last-mentioned bottles fall bottoms-first from said terminal end, and guide means at said station struck by said falling bottles which thereby guide the latter in an erect condition into said stalls, the improvement wherein said guide means include a plurality of arcuate drop-tube elbows of double curvature including an enlarged mouth portion, said elbows being disposed at the terminal end of the conveying table for directing the bottles from the latter into stalls, each stall including a slotted plate onto which the bottles are deposited, and a rotatable toothed cam wheel disposed in the slot of the slotted plate located at each said stall and onto which the bottles drop in a vertical position as well as in an untimed sequence from said table, alternate teeth of each said wheel being longer than intermediate teeth and serving simultaneously and directly to urge the bottles from the stalls.

---

## 4,213,527
## CHAIN LINK CONVEYORS

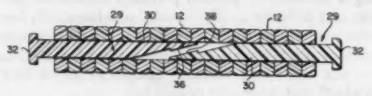
**James M. Lapeyre, and Fernand S. Lapeyre, both of New Orleans, La., assignors to The Laitram Corporation, New Orleans, La.**

**Continuation-in-part of Ser. No. 477,692, Jun. 10, 1974, abandoned, which is a division of Ser. No. 187,746, Oct. 8, 1971, Pat. No. 3,870,141, which is a continuation-in-part of Ser. No. 63,523, Aug. 13, 1970, abandoned. This application Jan. 17, 1977, Ser. No. 759,721**

**The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.**

**Int. Cl.[2] B29F *3/01***

**U.S. Cl. 198—853** **28 Claims**




1. A method of forming a link module for constructing linked conveyor structures comprising:

extruding a synthetic polymeric material through a die to form a continuous slab having first and second opposite edges formed as respective cylinders, the cylindrical axes of which are substantially parallel to one another, and a relatively high strength, rigid intermediate section integrally formed with and joining said opposite edges so as to preserve the parallel relationship of said axes and so as to resist bending stresses applied to said slab, said die having the shape of the cross-section of said slab taken perpendicular to the axes of said cylindrical apertures;

forming in each of said cylinders a coaxial cylindrical aperture circumscribed by said each cylinder;

removing portions of said slab including portions of said first and second opposite edges so as to form, respectively, first and second pluralities of spaced-apart link ends each circumscribing one of said cylindrical aperture, said link ends being dimensioned and spaced apart so that said module is end-to-end reversible and engageable with another one of said modules so that a cylindrical aperture of said module is coaxial with a cylindrical aperture in said another one of said modules.

11. In an integrally-formed plastic module for constructing linked structures for use in a conveyor system, said module, comprising in combination: a first plurality of link ends of substantially identical width, each link end being formed to circumscribe a pivotal hole, said holes of said first plurality being arranged coaxially; a second like plurality of link ends of substantially identical width, each link end of said second plurality being formed to circumscribe a pivotal hole, said holes of said second plurality being arranged coaxially, the axes of respective holes of both pluralities of link ends being substantially parallel; and an intermediate portion having opposing sides and being integrally formed with and joining said first and second pluralities of link ends so as to preserve the parallel relationship of said axes and so as to resist bending stresses applied to said module, said link ends of each of said plurality being dimensioned and spaced apart by a distance slightly greater than the width of each link end so that said module is end-to-end reversible and so that a plurality of said modules may be engaged with each other at said ends, the improvement comprising:

said module being extruded through a die member having a cross-sectional shape identical to the cross-section shape of said module taken through a plane perpendicular to the axes of said pivotal holes and cut to form said link ends; and

said module including a rib disposed on at least one of said sides of said intermediate portion for engaging drive means of said conveyor system, said rib including a flat surface and cylindrical side surfaces disposed along opposite edges of said flat surface, said cylindrical side surfaces having the same axis of revolution, said axis of revolution extending substantially parallel to said axes of said pivotal holes.

27. A linked belt for use in a conveyor system comprising in combination:

a plurality of like extruded plastic modules, each of said modules including a first plurality of link ends of like width, a second plurality of link ends each of said like width, and an intermediate portion having opposing sides and integrally formed with and joining said first and second pluralities of link ends, said intermediate portion including a rib formed on one of said sides for engaging drive means of a conveyor system, said rib including a substantially flat surface and cylindrical side surfaces disposed along opposite edges of said flat surface;

said link ends of each of said modules being releasably engaged between and substantially in contact with the link ends of an adjacent module except for individual link ends disposed at the extreme sides of said belt; and

means for pivotally connecting said modules at engaged link ends so that each said rib of each module extends across said belt.

---

## 4,213,528
## PACKAGE FOR ACID CONTAINER

**George D. Kreutz, Dallas; L. J. Scott, Lewisville, and James P. Kelly, Arlington, all of Tex., assignors to Becton Dickinson & Company, Paramus, N.J.**

**Filed Sep. 13, 1978, Ser. No. 942,049**

**Int. Cl.[2] B65D *81/26, 85/84***

**U.S. Cl. 206—205** **15 Claims**

1. A package for an acid container, comprising:

an acid resistant envelope and test container for an acid

container whereby acid can be released from an acid container into the envelope for use in a procedure in the envelope and a separate removable absorbent shield within the envelope for enclosing an acid container, said absorbent shield including a material to neutralize acid whereby any acid released from an acid container in the envelope is absorbed and wholly or partially neutralized by said absorbent shield.

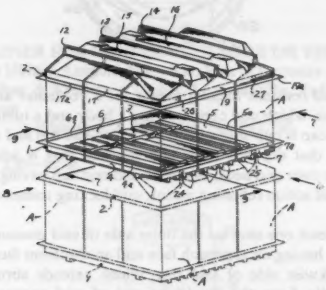
---

**4,213,529**

## MEANS FOR STACKING AND SHIPPING CONTAINERS IN MULTIPLES

**James L. Whitaker, Ft. Lauderdale, Fla., assignor to Frank B. Robb, Willoughby, Ohio, a part interest**

**Filed Apr. 20, 1979, Ser. No. 31,934**
**Int. Cl.² B65D *85/62, 19/00***
**U.S. Cl. 206—427** **10 Claims**



1. A stackable shipping package comprising a pair of tray-like members of relatively thin material which is stiffened by the formation in manufacture, between and by which members, a series of articles is supported, each member having a body conforming at least in part to the portion of such article adjacent thereto, and each member having a peripheral lip thereon and within which such articles are confined in juxtaposition, each of said members further having engaging means to interengage corresponding means of like packages respectively above and below such package, all such packages being thereby positioned in vertically arranged relationship.

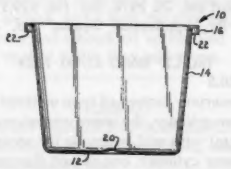
---

**4,213,530**

## CONTAINERIZED PIPE COATING MATERIAL

**Robert J. Harris, Marrero, and Gail T. Sikes, Harvey, both of La., assignors to H. C. Price Co., Bartlesville, Okla.**

**Division of Ser. No. 816,652, Jul. 18, 1977, abandoned, which is a continuation of Ser. No. 708,196, Jul. 23, 1976, Pat. No. 4,073,760. This application Feb. 12, 1979, Ser. No. 11,082**
**Int. Cl.² B65D *81/00, 85/00***
**U.S. Cl. 206—447** **6 Claims**



1. An improved containerized pipe coating including an asphalt base coating material comprising about 10% to 25% by weight asphalt and about 75% to 90% by weight aggregate, and a container capable of being melted and mixed with said material to enhance the physical properties thereof, said container comprising no more than about 5% by weight of the coating material contained thereby and said container being constructed primarily from a material containing at least one of the members of the group consisting of polyethylene, polypropylene, and polyethylene-polypropylene copolymer.

---

**4,213,531**

## CARD WITH REMOVABLE THREE DIMENSIONAL FIGURINE

**Donald A. Rae, P.O. Box 51, Jenkintown, Pa. 19046**

**Continuation-in-part of Ser. No. 852,801, Nov. 18, 1977. This application Mar. 10, 1978, Ser. No. 885,394**
**Int. Cl.² B65D *73/00, 85/00***
**U.S. Cl. 206—463** **7 Claims**

1. A card suitable for removably retaining an object comprising

a unitary planar card body having a front face and a rear face;

the card body being provided with a cut away area extending from the front face to the rear face, the cut away area being of configuration to frictionally engage and retain a peripherally configured, three dimensional object therein;

a peripherally configured, three dimensional object removably associated with the card body, the object being configured and adapted to be held within the cut away area of the card body by frictional engagement between at least a portion of the periphery of the object and at least a portion of the edge of the cut away area, a front portion of the object extending forwardly of the front face and a rear portion of the object extending rearwardly of the rear face;

a flexible wrapping enclosing completely the three dimensional object and at least a portion of the card body, the wrapping being in direct contact with the card body front face and rear face, the wrapping also being in direct contact with the front portion of the object and with the rear portion of the object, and

a novelty item enclosed with the card body and the object by the wrapping, the said wrapping contacting directly the object;

whereby the object is removably retained within the card and is adapted for subsequent removal and reinsertion and whereby the novelty item is retained in association with the card in a protected manner to prevent contamination.

---

**4,213,532**

## ELECTRICAL HOUSING WITH STACKING BUMPERS

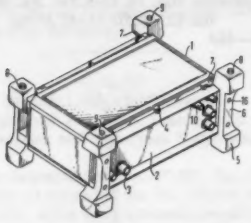
**Hans-Joachim Eggert, Karlsfeld; Heinrich Zenkert; Rudi Kuehne, both of Munich, and Otto Oberberger, Gilching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jul. 26, 1976, Ser. No. 708,899**
**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538340**
**Int. Cl.² B65D *21/02, 25/26***
**U.S. Cl. 206—504** **10 Claims**

1. A protective bumper element attachable to a housing of an

electric device, the housing having vertical side walls and vertical and horizontal edges formed in a rectangle, and said element being attachable to the housing adjacent one of said vertical edges to protect the housing from shocks and to facilitate stacking of housings provided with similar bumper elements on four corners thereof, each said bumper element comprising:

a flexible, central, elongated handle portion spaced from an adjacent one of said vertical edges and from adjacent vertical walls sufficiently for grasping said handle portion by hand thereabout;



a thickened portion on either end of said handle portion;

a pair of metal inserts integrally affixed to said bumper in said thickened portions thereof, said inserts being longitudinally aligned with one another and having surface means engaging respective corners of said housing; and

means for affixing said bumper element securely to said housing whereby each said thickened portion extends beyond three sides of said housing at each respective corner.

---

**4,213,533**

## AUTOMATIC MACHINE FOR IN PARTICULAR CALIBRATING FRUIT AND VEGETABLES

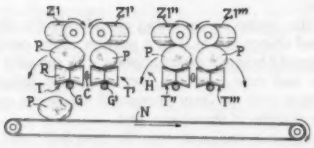
**Alberto Sardo, Le Chesnay, France, assignor to Xeda International S.A., LaChesnay, France**

**Filed May 3, 1978, Ser. No. 902,276**

**Claims priority, application Italy, May 18, 1977, 12609 A/77**

**Int. Cl.[2] B07C 5/12**

**U.S. Cl. 209—654** **6 Claims**




1. An automatic machine for calibrating in a continuous cycle substantially round, oblong or spherical objects with or without flattened poles and in particular fruits and vegetables, comprising: means for conveying said objects in Indian file, in at least one row; means for constraining said objects to rotate in a suitable manner on said conveying means and place their equatorial plane vertically; rotary calibrating means placed in an adjustable position above said conveying means at a distance which decreases in a direction in which said rotating objects are conveyed by the conveying means, the disposition relative to said conveying means and the direction of rotation of said calibrating means being such that in coming in contact with the equatorial part of said rotating objects the calibrating means delicately constrain said objects to laterally leave said conveying means; discharge means positioned for receiving said objects immediately and at an output end of said rotary calibrating means and conveying said objects in a plurality of separate rows, each of which rows corresponds to a different calibre of said objects, to receiving stations.

**4,213,534**

## CHILD-RESISTANT CLOSURE

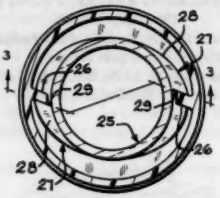
**Gary V. Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.**

**Continuation-in-part of Ser. No. 966,946, Dec. 6, 1978, Pat. No. 4,172,533. This application Jun. 28, 1979, Ser. No. 52,864**

**The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.**

**Int. Cl.[2] B65D 55/02, 85/56; A61J 1/00**

**U.S. Cl. 215—216** **4 Claims**




1. Child-resistant locking means for a container and a cap therefor in which said container has a body and a tubular neck and said cap is cup-shaped and has a disc-like top and an annular skirt that depends from said top and that is adapted to telescope over said neck, said neck and said cap having cooperating twist action retaining means, said locking means comprising,

(a) at least one stop on the outer side of said container, said stop having an approach face and an abutment face on the clockwise side of said stop which extends abruptly inwardly from the clockwise end of said approach face toward the axis of said neck and which lies in a plane which is (1) parallel to the axis of said neck and (2) is inclined backwardly from the end of said approach face and intersects the exterior of said neck at an angle of less than 90° to a tangent to said neck at the line of intersection,

(b) a second, resiliently deformable, portion on said cap which is concentric with said annular skirt, and

(c) a lug on said second portion that is engageable with said approach face of said stop when said cap approaches closed position on said neck and normally is engageable with said abutment face when said cap is rotated from closed position in a retrograde direction.

---

**4,213,535**

## FLUID RESERVOIRS FOR MASTER CYLINDERS

**Masashi Ban; Tomio Tachino, both of Kariya, and Jiro Kizaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Jul. 28, 1978, Ser. No. 929,177**

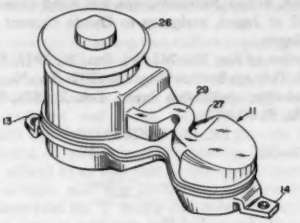
**Claims priority, application Japan, Jul. 30, 1977, 52-102775[U]**

**Int. Cl.[3] B65D 85/00, 1/24**

**U.S. Cl. 220—20.5** **2 Claims**

1. In a fluid reservoir formed of resin material for attachment to a metal master cylinder, the improvement comprising a pair of flanges integral with said reservoir for securing said reservoir to said master cylinder, one of said flanges being formed at each opposed end of said reservoir substantially parallel to its longitudinal axis, each said flange having a first portion longitudinally extending from the peripheral wall of said reservoir, a second portion downwardly extending from said first portion and being spaced from the peripheral wall of said reservoir, and a third portion horizontally extending from said

second portion and defining means for securing said reservoir to said master cylinder, each said flange being bendable for




compensating for stresses imposed by differences in thermal expansion of said reservoir and said master cylinder.

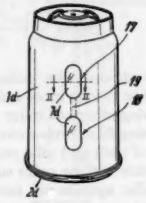
---

**4,213,536**

## CONTAINER FOR CONVOLUTED WIRE OR THE LIKE

**Manfred Häfner, Leopoldshöhe, Fed. Rep. of Germany, assignor to Häfner & Krullmann GmbH, Leopoldshöhe, Fed. Rep. of Germany**

**Filed Oct. 2, 1978, Ser. No. 947,735**
**Int. Cl.[2] B65D *25/54***
**U.S. Cl. 220—82 R** **7 Claims**




1. A container, particularly for storage and/or shipment of thin wire therein which is convoluted on a plastic reel or the like, comprising an end wall; a tubular section of synthetic plastic material including an end portion connected with said end wall, said section comprising a solid unitary wall and having an inner surface and an outer surface unitarily connected, at least two window openings extending between said surfaces and a peripheral edge face bounding each one of said window openings; and a viewing element including at least two transparent or translucent panes each installed in one of said window openings and each having an inner pane surface, an outer pane surface and a circumferentially extending edge face between the inner and outer surfaces, said pane surfaces of each of said panes being flush with the respective surface of said tubular section and the edge faces of said window openings and said panes having complementary male and female portions received within each other and connecting said panes to said tubular section, and a web integral with and interconnecting said panes and embedded within said tubular section and being of a smaller width than said panes.

---

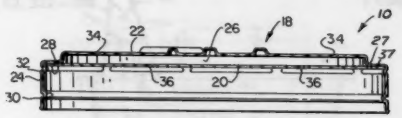
**4,213,537**

## CONTAINER LID ASSEMBLY

**Patrick W. Caccavale, Kensington, Conn., assignor to Sherri Cup, Inc., Kensington, Conn.**

**Filed Sep. 20, 1978, Ser. No. 943,987**
**Int. Cl.[2] B65D *51/16, 41/18, 41/62***
**U.S. Cl. 220—215** **1 Claim**

1. An insulated cover assembly for a paper receptacle having an upwardly facing annular seating surface at its open upper end, said cover assembly comprising a lid made from plastic material of substantially uniform thickness having a circular top wall including a generally cylindrical downwardly opening recess having a diameter substantially equal to the diameter of the open upper end of the receptacle and partially defining an empty chamber, said top wall having a raised design thereon further defining said chamber, said top wall having at least one vent opening therethrough and including a radially disposed annular outer marginal portion defining the open end of said recess and the outer peripheral edge of said top wall, said outer marginal portion having a radially disposed downwardly facing annular bearing surface, said lid having a generally cylindrical side wall integrally connected at its upper end to said outer peripheral edge and extending downwardly therefrom, said side wall having beads spaced downwardly from said




outer marginal portion and projecting radially inwardly beyond the cylindrical inner surface of said side wall, a substantially flat circular insert received within said lid and having an annular marginal portion disposed in bearing engagement with said bearing surface, said insert cooperating with said lid to further define said chamber and having another vent opening therethrough out of registry with said one vent opening, one of said beads retaining said insert in snap-in assembly with said lid with said annular marginal portion in bearing engagement with said bearing surface, said annular marginal portion engaging the upwardly facing seating surface when said cover assembly is positioned on the receptacle, another of said beads releasably retaining said cover assembly in snap-on assembled relation to the receptacle.

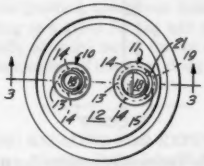
---

**4,213,538**

## CAN END CLOSURE

**Alfred H. Boardman, Hamilton, Canada, assignor to American Can Company, Greenwich, Conn.**

**Filed Jul. 9, 1979, Ser. No. 55,897**
**Int. Cl.[2] B65D *41/32***
**U.S. Cl. 220—268** **10 Claims**




1. An end cover for a container comprising:

a central panel having a pour opening and a closure tab therefore dimensioned and configured to close said pour opening,

a hinge for connecting said closure tab to said central panel for mounting said closure tab for controlled displacement relative to said central panel about the axis of said hinge,

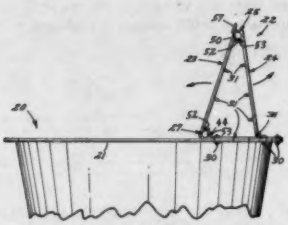
scored lines defining at least a part of said tab configuration and extending from the ends of said hinge axis along the periphery of said closure tab for a predetermined distance to act as a restraint up to a preset force against inward movement of said closure tab,

a severed line defining the remaining periphery of said tab and extending from said scored lines and interconnecting same and having a marginal portion formed to extend and engage said central panel to resist movement outwardly of

said central panel when subjected to internal container pressure.

---

**4,213,539**
**CONTAINER COVER HINGE MEANS**
Edward J. Reuter, Excelsior, Minn., assignor to Reuter, Inc., Hopkins, Minn.
Filed Mar. 12, 1979, Ser. No. 19,771
Int. Cl.[2] B65D *43/14, 57/04*
U.S. Cl. 220—333 4 Claims



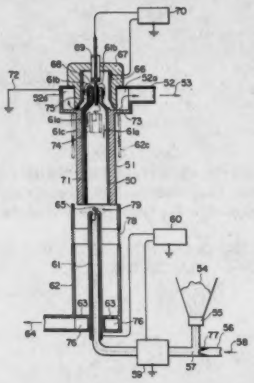
1. A container top comprising first and second sections hinged together along apposed edges, and dams on said top in addition to the hinge extending along said opposed edges to prevent water collecting on said top from running into the container at the hinge.

---

**4,213,540**
**BREAD BOX DISPENSER**
Louise A. Stanford, 2009 Brighton Rd., Avondale, Md. 20018
Filed Jul. 31, 1978, Ser. No. 929,238
Int. Cl.[2] B65H *3/22*
U.S. Cl. 221—150 R 1 Claim

1. A bread box for dispensing bread by the slice comprising a container, refrigeration means disposed within said container, first biasing means for translating the bread in a substantially horizontal direction to an outlet on the dispenser box, and latch means disposed on said outlet of the dispenser whereby one slice of bread can be dispensed at a time while the next slice of bread in line is retained by means to prevent its removal in which means to prevent the next slice of bread from being removed includes at least one pin element adapted to engage said slice of bread and second biasing means to allow said pin to be removed said means to prevent removal further includes a door having a outwardly rectangularly flanged area, a lip extending beyond two sides of said flanged area having a narrow outwardly extending portion, and a vertically upstanding wider portion whereby when said door is pulled vertically upward, the pin and second biasing means ride into the narrower portion of said lip and constrain the second slice of bread by pressing said pin element into the bread.

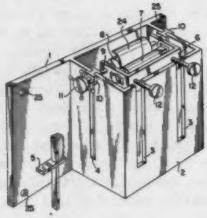
**4,213,541**
**METALLIC SQUEEZE-OUT TUBE WITH RESINOUS LAYER ON ITS SURFACE**
Tsutomu Itoh, Tokyo; Nobuo Furuya, and Kenji Ohuchi, both of Chiba, all of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan
Continuation of Ser. No. 762,504, Jan. 26, 1977, Pat. No. 4,112,869. This application Aug. 26, 1977, Ser. No. 827,890
Claims priority, application Japan, Feb. 3, 1976, 51-010005; Mar. 8, 1976, 51-024867
Int. Cl.[2] B65D *35/16*
U.S. Cl. 222—92 8 Claims



1. A metallic squeeze-out tube including inner and outer surfaces, a neck portion having inner and outer surfaces, and a shoulder portion having inner and outer surfaces and having a continuous resin coating film formed over and tightly adhered to the inner surface of both said tube and neck, the outer surface of the neck portion and the outer surface of the shoulder portion of the metallic squeeze-out tube, said resin coating formed of powder paint particles electrostatically adhered to said surfaces and fused together to provide a solidified film layer tightly adhered to said surfaces

---

**4,213,542**
**TOOTH PASTE DISPENSER**
Bobby R. Wilson, 468 Iroquois Ave., Akron, Ohio 44305
Filed Mar. 7, 1979, Ser. No. 18,591
Int. Cl.[3] B65D *35/28*
U.S. Cl. 222—102 1 Claim



1. A dispensing device for dispensing the contents of a collapsible tube comprising:
(A) A plaque for mounting on the wall, having thereto affixed at least one toothbrush holder and a collapsible tube container;
(B) Said container having front, side and bottom walls with said plaque forming the back wall;
(C) Said front and side walls having elongated slots running vertically and aperture means in the bottom wall of the container;

(D) Said container having therein a vertically movable dispensing means, said dispensing means having front and side walls forming a carriage, said side walls having elongated slots and said front wall having a threaded opening; and

(E) Said carriage including two rollers engaging a vertically disposable tube having one roller bearing means adjustable in a horizontal plane within said slots in said carriage by a threaded screw means passing through said slots in said container and being threadly received by said threaded opening in said carriage to provide adjustment movement to said one roller bearing means, a second roller affixed to an axle that is rotationally secured within said carriage, said axle continuing through the carriage and supported by "I" joints that move in a vertical plane in said slots in said side walls, said axle having thereto affixed a knob to drive said carriage in a vertical plane by friction contact with said vertical disposable tube.

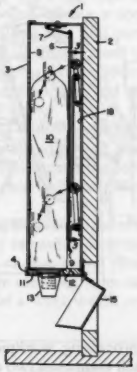
---

**4,213,543**

## DISPENSER FOR DISPENSING THE CONTENTS OF COLLAPSIBLE PACKAGES

**James E. Thiem, Route 2, P.O. Box 580, Brevard, N.C. 28712**

**Filed May 8, 1978, Ser. No. 903,608**
**Int. Cl.[2] B65D *35/28***
**U.S. Cl. 222—103** **10 Claims**



1. A dispensing apparatus for dispensing the contents of collapsible packages comprising:

(a) a housing mountable to a supporting surface, said housing having an outlet at one end through which a collapsible package discharge outlet is extendable;

(b) a pressure plate extending longitudinally within said housing and defining one side of a collapsible package receiving chamber, and cooperating with a first opposing wall of said housing to dispense the contents of said package, said pressure plate extending from adjacent said one end to adjacent another innermost end of the housing opposite said one end and mounted for movement in an arc toward said opposing wall in such a manner that the entire pressure plate moves axially toward said outlet; and

(c) actuating means for shifting said pressure plate toward said first wall of said housing to collapse said package and dispense the contents thereof, said actuating means including a pair of pressure arms, each pressure arm being pivotally connected at a first end to a second wall of the housing and engageable at a second end with spaced portions of said pressure plate, link means interconnecting said pressure arms for joint movement between a first position with the section end of one pressure arm adjacent said innermost end of said housing and the second end of the other pressure arm in a central zone of said housing located intermediate said one end and said innermost end, and a second position with said one pressure arm displaced to said central zone and said other pressure arm displaced away from said central zone toward said outlet end of the housing, and operating means for pivotally swinging said pressure arms along said pressure plate for causing displacement of said pressure plate toward said first wall, whereby said package is collapsed between said first wall and said pressure plate and the contents thereof is dispensed.

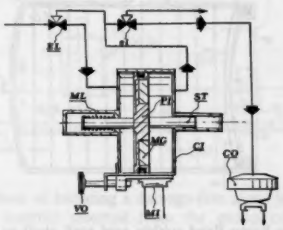
---

**4,213,544**

## WATER PROPORTIONING AND DELIVERING DEVICE PARTICULARLY FOR COFFEE MACHINES

**Alberto S. Pandolfi, c/o Ing. Misitano A.G. Via Padova, 217, 20127 Milano, Italy**

**Filed Dec. 26, 1978, Ser. No. 972,889**
**Int. Cl.[2] G01F *11/06***
**U.S. Cl. 222—250** **1 Claim**




1. A water proportioning and delivering device particularly for coffee machines comprising a cylinder for receiving the liquid, a double acting piston slidable in the said cylinder to control the volume of liquid supplied thereto and to dispense liquid therefrom, the said double acting piston comprising a first and a second piston rod, the said cylinder extending with a first and a second hollow portion sized to receive the said first piston rod and said second piston rod and external switch means responsive to the length of stroke of the piston to control the stroke of the piston in the cylinder, switch operating means comprising a magnetic mass disposed concentrically about the axis of displacement of the piston and the switch means comprising a magnetically responsive microswitch disposed externally of the cylinder at a location in the path of travel of the magnetic field associated with the magnetic mass, a return spring mounted around the first piston rod and housed within the said first hollow portion and operable to return the piston to an initial position, the second hollow portion of the cylinder operating as a guide for the said second piston rod, adjusting manually actuated means for the said switch means able to adjust the location of the latter along a generatrix of the said cylinder.

---

**4,213,545**

## EXPANDING BELLOWS FOR EXPULSION TANK

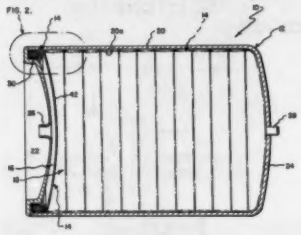
**Leo M. Thompson, Niagara Falls; John Z. Colt, Williamsville, and Robert J. Szpakowski, Kenmore, all of N.Y., assignors to Textron, Inc., Providence, R.I.**

**Filed Sep. 20, 1978, Ser. No. 943,948**
**Int. Cl.[2] B67D *5/54***
**U.S. Cl. 222—386.5** **7 Claims**

1. In a positive expulsion tank having a tank shell defined by first and second end walls and a side wall connecting said end walls; a bellows arranged within said tank shell and cooperating therewith to define product storage and expulsion fluid chambers, said bellows having one end fixed to said tank shell and an opposite end closed by a piston head extending transversely of said side wall, said bellows having convolutions consisting of crest portions, joining side wall portions, and root portions for connecting side wall portions of adjacent convolutions, said bellows being axially extendible under control of expulsion fluid within said expulsion fluid chamber to position said piston head adjacent alternate ones of said end walls of said tank shell to define product chamber full and empty condi-

tions of said tank, said bellows having limiting modes of extreme compression and extreme extension bounding a normal operating mode in which said convolutions may undergo resilient deformation and beyond which plastic deformation of said convolutions occurs; and product and expulsion fluid flow control means mounted by said tank shell for flow communication with said product storage and expulsion fluid chambers, respectively, the improvement comprising in combination:

a plurality of reinforcing rings fixed one within each of said crests and operable to limit radially inwardly directed plastic deformation thereof away from said side wall of said tank shell incident to axial extension of said bellows beyond said limiting mode of extreme extension, said



bellows being fixed within said tank shell to perform in said normal operating mode incident to said product chamber full condition of said tank to accommodate for temperature induced expansions/contractions of said stored product, said bellows being sized to undergo plastic deformation without puncture failure of said convolutions incident to axial extension thereof beyond said limiting mode of extreme extension into said product chamber empty condition, and said root portions being displaced radially outwardly towards said side wall of said tank shell incident to said axial extension of said bellows to lie in essential alignment with adjacent ones of said crest portions when said bellows is disposed in said product chamber empty condition.

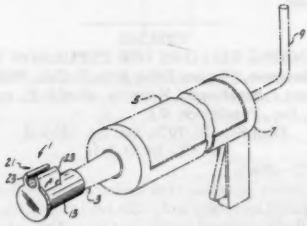
---

**4,213,546**

## CAP FOR THE NOZZLE OF A CAULKING CARTRIDGE

**Richard C. Massey, 12301 Ballas La., St. Louis, Mo. 63131**

**Filed Sep. 20, 1978, Ser. No. 944,184**
**Int. Cl.[2] B65D *47/04***
**U.S. Cl. 222—546** **6 Claims**



1. For placement on the end of a nozzle, such as the nozzle of a cartridge adapted to be loaded into a dispensing tool for dispensing caulking or other hardenable and extrudable material from the cartridge, a cap for sealing the nozzle and preventing discharge therefrom, said cap comprising an elongate hollow body closed at one end constituting its front end and open at its back end for placement of the cap on the nozzle with the nozzle received inside said body, an elongate plug formed integrally with the body and extending rearwardly within the body from the front end thereof, said plug being adapted to enter the nozzle and plug it on placement of the cap on the nozzle for sealing the nozzle and preventing said discharge, and a spring clip formed integrally with the body on the outside of the body for detachably mounting the cap on a generally rod-shaped handle of the dispensing tool with the longitudinal axis of the cap generally parallel with the handle when the extrudable material is being dispensed from the cartridge via the tool, said clip comprising a pair of relatively wide arms extending one alongside the other on the outside of the body axially of the body and defining an elongate passage therebetween decreasing in size from one end to the other for receiving said handle, said arms being of resilient material and adapted to flex apart and grip the handle when the handle is received in said passage thereby to mount the cap on the handle.

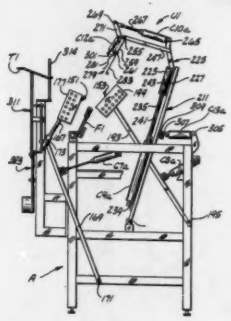
---

**4,213,547**

## METHOD OF AND APPARATUS FOR PROCESSING PARTS OF GARMENTS, SUCH AS COLLARS

**William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Shelbyville, Tenn.**

**Filed Oct. 4, 1978, Ser. No. 948,558**
**Int. Cl.[2] A41H *43/00, 33/00***
**U.S. Cl. 223—2** **31 Claims**



1. Apparatus for processing workpieces such as parts of garments each of which comprises two or more superimposed plies of material which have been seamed adjacent an edge thereof and which are unseamed at an edge opposite the seamed edge, said apparatus comprising:

means for holding a workpiece in a turned condition with the seam inturned, the plies of the workpiece thereby having inturned margins at said edge joined by the seam, said holding means being adapted to extend between plies of the workpiece from the unseamed edge thereof and having an edge which is receivable in the infolded margin of a ply and which is engageable with the workpiece at its seamed edge;

a press for pressing a workpiece on the holding means, said press comprising a pair of platens for pressing engagement with opposite faces of the workpiece on the holding means, said platens being relatively movable away from one another to a retracted position wherein they are spaced apart and thereby open for entry therebetween of the holding means carrying a workpiece between the platens with one face of the workpiece facing toward the first platen and its other face facing toward the second platen;

the holding means being movable from a loading station spaced from the press, where a workpiece may be applied to the holding means in the stated turned condition, to a pressing position between the opened platens, and the apparatus having means for moving the holding means between said loading station and said pressing position, and means for effecting relative movement of the platens

for closure thereof to press the opposite faces of the workpiece on the holding means and concomitantly effecting a relative movement of at least one of the platens and the holding means in a direction to effect a wiping action on the workpiece drawing it in the direction away from the seamed edge of the workpiece held at said edge of the holding means toward the unseamed edge of the workpiece.

---

**4,213,548**

**INSULATIVE WIDE STYLE WATCHBAND**

**Bruce G. Wood, 6867 Mission Gorge Rd., San Diego, Calif. 92120**

**Filed Jul. 10, 1978, Ser. No. 923,180**
**Int. Cl.[2] G04B *37/14;* A44C *5/00***
**U.S. Cl. 224—168** **2 Claims**

1. An insulative wide style watchband, comprising:

(a) an elongated band of electrically insulative material with one end portion having a first type of fastener means and the other end portion having a second type of mating fastener means so that said end portions are capable of releasible interlocking engagement to form a bracelet;

(b) said band having a pair of transverse opposed openings intermediate said end portions and spaced apart longitudinally of the band;

(c) strap structure of a width less than the width of said band, secured to said band and having portions thereof extending through said openings in the form of spaced opposed loops capable of receiving the lateral retaining pins of a wrist watch; and

(d) said strap having permanent securing means at one end thereof and easily releasible securing means at the other end of the strap, so that lateral retaining pins of a wrist watch need not be removed from the watch in mounting and/or removal of a wrist watch on or from the watchband.

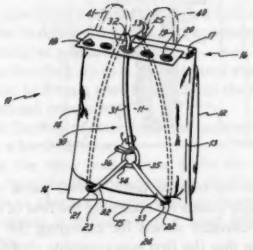
---

**4,213,549**

**WATERPROOF STORAGE BAG AND BACKPACK**

**Linda A. Hibbard, Boulder, Colo., assignor to Phoenix Products, Inc., Tyner, Ky.**

**Filed Jun. 18, 1979, Ser. No. 49,941**
**Int. Cl.[3] A45F *3/04;* B65D *30/10***
**U.S. Cl. 224—209** **11 Claims**



1. A portable storage bag having enclosed sides and bottom and a top closure having a closure flap, said bag further including:

two spaced apertures in a bottom portion of the bag, said apertures being spaced from an interior of said bag,

at least one aperture in said closure flap, and

encircling strap means extending through said one aperture and across a front side of said bag and through said two spaced apertures, said strap means extending from said two apertures across a rearward side of said bag and over the top of said bag to said one aperture.

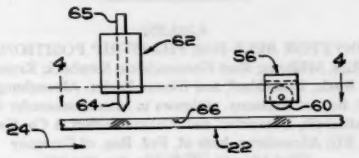
---

**4,213,550**

**METHOD OF AND APPARATUS FOR INITIATING A DAMAGE-FREE SCORE IN A REFRACTORY MATERIAL**

**Robert M. Bonaddio, Fresno, Calif., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Oct. 6, 1978, Ser. No. 949,347**
**Int. Cl.[2] C03B *33/02;* B26D *3/08;* B26F *3/00***
**U.S. Cl. 225—2** **17 Claims**



1. A method of initiating a damage-free score in a piece of refractory material selected from the group consisting of glasses, ceramics and glass-ceramics, comprising the steps of:

imposing a zone of damage in the piece;

engaging the piece at a position on the surface of the piece is spaced relation to the zone of damage with scoring means capable of imposing a damage-free score in the piece;

moving the scoring means and zone of damage in a continuous motion relative to one another to move the scoring means through the zone of damage to initiate a damage-free score; and

moving the piece and scoring means relative to one another to impose a damage-free score in the piece.

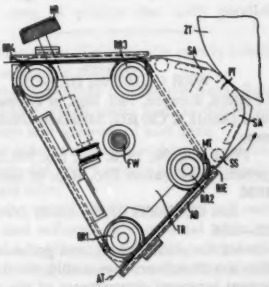
---

**4,213,551**

**RECORDING CARRIER TRANSPORT ASSEMBLY FOR USE WITH SIDE MARGIN PUNCHED RECORDING CARRIER WEBS**

**Josef Windele, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 21, 1977, Ser. No. 853,283**
**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717315**
**Int. Cl.[2] B65H *17/38***
**U.S. Cl. 226—74** **8 Claims**



6. A combined transport and feed unit for moving a side margin punched recording carrier past an intermediate carrier in a nonmechanical printing device comprising: parallel spaced

apart housing members supporting at least three axially aligned rotatable wheel pairs, a belt trained around the wheels of each of the housing members, the belt having a plurality of spaced apart projecting recording carrier hole engaging pins thereon, at least one pair of wheels interconnected by a driven shaft, the housing members being pivotable about the driven shaft, a feed assembly carried by said housing members, the belts effective to engage a recording carrier at an upstream end of the unit and to transport the recording carrier by engagement of the pins with the recording carrier holes to an upstream end of the feed assembly, to thereafter disengage from the recording carrier and to re-engage the recording carrier at a downstream end of the feed assembly and to transport the recording carrier to a downstream end of the unit, each of the wheel pairs having axes, the axes of the at least three axially aligned rotatable wheel pairs being spaced from one another such that they form apexes of a triangle.

---

**4,213,552**

## CONVEYOR BELT FOR FILMSTRIP POSITIONING

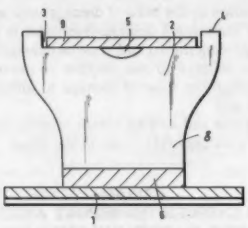
**Karl Ries, Mülheim; Kurt Hannoschöck, Sonsbeck; Krsto-Marijan Rozic, Düsseldorf, and Günter Basler, Ahrensburg, all of Fed. Rep. of Germany, assignors to Mannesmannufer Aktiengesellschaft, Düsseldorf and Richard Seifert & Co. GmbH & Co. KG, Ahrensburg, both of, Fed. Rep. of Germany**

**Filed May 11, 1978, Ser. No. 904,743**

**Claims priority, application Fed. Rep. of Germany, May 11, 1977, 7715354**

**Int. Cl.[2] B65H *17/34***

**U.S. Cl. 226—170** **5 Claims**



1. Conveyor belt for moving film strips into particular positions relative to a test object for exposure to X-rays examining the test object, comprising:

a toothed belt and a cover on a surface of the belt facing away from the teeth of the belt, the cover being made of a material different from the material of which the belt is made, the cover having a considerably higher resiliency than the belt, said cover being constructed in respect to its surface contour as a shallow flat trough for holding such film.

---

**4,213,553**

## WEB GUIDING DEVICE

**Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany**

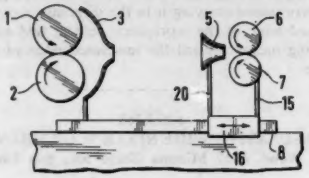
**Filed Aug. 30, 1978, Ser. No. 938,330**

**Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741095**

**Int. Cl.[2] B65H *23/04*; G03B *1/48***

**U.S. Cl. 226—196** **10 Claims**

1. In a device for withdrawing and gathering a fiber web discharged by a web delivering assembly; the device including a guide element arranged downstream of the web delivering assembly as viewed in the direction of web advance and having an outlet opening through which the web leaves the guide element; a trumpet arranged downstream of the guide element; and a calender roller pair arranged downstream of the trumpet and forming a calender assembly with said trumpet; the improvement comprising means for displaceably supporting said



trumpet, said roller pair and said guide element for movement as a unitary structure with respect to said web delivering assembly.

---

**4,213,554**

## FRICTION WELDING MACHINE

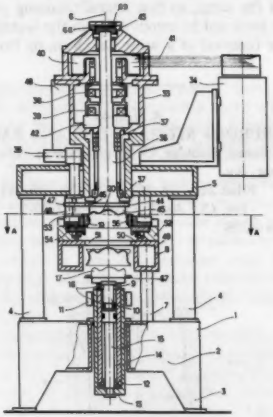
**Mario M. Sciaky, Paris, France, assignor to Sciaky Intertechnique, S.A., Fribourg, Switzerland**

**Filed Dec. 22, 1978, Ser. No. 972,447**

**Claims priority, application France, Jan. 5, 1978, 78 00260**

**Int. Cl.[3] B23K *20/12, 37/02***

**U.S. Cl. 228—2** **9 Claims**



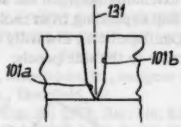
1. A machine for friction welding two parts, comprising a first non-rotatable means for clamping the first of the said parts and a second rotatable means for clamping the second part, characterized in that the first non-rotatable clamping means is movable along the axis of rotation of said second rotatable means and that the said rotatable clamping means is composed of a driven mandril and a headstock for clamping between them the second workpiece, this headstock being movable along the said axis of rotation and being provided with means for supporting the two pieces co-axially.

4,213,555

## METHOD AND APPARATUS FOR AUTOMATIC WELDING OF BEVELLED TUBES

Andre E. Minkiewicz, Fontenay aux Roses, and Norbert Poirier, Paris, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Mar. 31, 1978, Ser. No. 892,355
Claims priority, application France, Mar. 31, 1977, 77 09824
Int. Cl.[2] B23K *9/02*
U.S. Cl. 228—29 11 Claims




1. A method of welding the bevelled ends of two tubes using an automatic welding device, said tube bevels having no root-faces, comprising (a) arranging said tubes into contact with a local gap varying between 0 and 2 mm; (b) automatically positioning said entire welding device in a predefined relationship with the plane defined by the meeting plane of said tubes; and (c) making a plurality of welding runs, all said runs being made on the outside of said tubes.

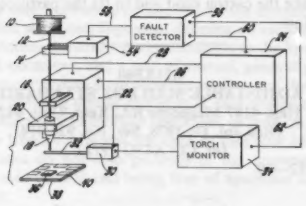
---

4,213,556

## METHOD AND APPARATUS TO DETECT AUTOMATIC WIRE BONDER FAILURE

Frederick M. Persson, and David C. Frankel, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1978, Ser. No. 947,493
Int. Cl.[2] H01L *21/90*
U.S. Cl. 228—104 2 Claims




1. A method of bonding a wire to interconnect first and second conductors and detecting a bond failure comprising the steps of

supplying wire from a source through a hollow bonding tip,

applying the bonding tip to the first conductor to bond the wire thereto at a first bond site,

moving the bonding tip to a second bond site at the second conductor to form a wire bridge from the first conductor to the second conductor,

sensing the feeding of wire from the source to the bonding tip by a wire feed sensor,

monitoring the wire feed sensor while the bonding tip is moving from the first conductor to the second conductor whereby an absence of wire feeding during said bonding tip movement is indicative of a bond failure at the first conductor,

applying the bonding tip to the second bond site to bond the wire thereto,

moving the bonding tip away from the second bond site to a preset location, clamping the wire at a preset time during the movement so that a short pigtail will be pulled from the tip and the wire will break from the second bond site at the preset time if a sound bond is made there and will break at a second later time if the bond pulls loose from the second bond site,

momentarily releasing the clamp at a time between the preset time and the second time to pull an additional pigtail length from the tip if due to bond failure the wire did not break at the second bond site,

passing an electronic flame off electrode under the bonding tip when reposed at its preset location to form a ball on the end of the pigtail whereby the electrode will touch the pigtail if the said additional length extends from the tip, and

monitoring the electronic flame off electrode to sense whether it touches the pigtail thereby providing a signal if the bond pulled loose from the second bond site.

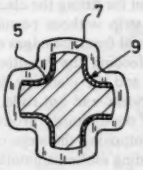
---

4,213,557

## METHOD FOR PRODUCING A MASS FILTER ANALYZER SYSTEM AND ANALYZER SYSTEM PRODUCED ACCORDING TO THE METHOD

Jochen Franzen, Wildeshausen, and Gerhard Weiss, Varrel, both of Fed. Rep. of Germany, assignors to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft, Bremen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,132
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737903; Nov. 24, 1977, 2752674
Int. Cl.[2] B23K *1/02;* C03B *23/04*
U.S. Cl. 228—122 7 Claims




1. A method for producing a highly precise and inherently stable analyzer system for a multipole mass filter comprising the steps of:

providing a core of precise size with parallel grooves therein;

providing a tube made of electrically poorly conductive and thermally softenable material;

placing electrically highly conductive metal foils, particularly of a metal which easily joins to the softenable tube material, into said grooves of said core;

disposing said tube over said core having said metal foils in said grooves, said core having a higher expansion coefficient than said tube;

heating the tube material and core so that said metal foils are joined to said softened tube material when said tube is softened and conforms to the configuration of said core;

cooling said heated tube and core until said tube material solidifies; and

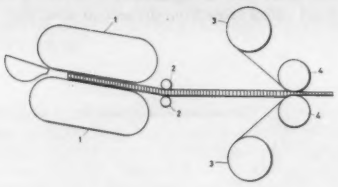
removing said tube from said core, said metallic foils connected to impressed indentations of said tube formed by said core being removed at the same time together with said tube.

4,213,558

## CONTINUOUS CASTING AND CLADDING PROCESS AND APPARATUS FOR PRODUCING METAL CLAD

Koei Hirobe, Nishinomiya; Kiyomi Yanagida, Suita; Tadashi Hirokane, and Akihiko Takahashi, both of Nagoya, all of Japan, assignors to Sumitomo Aluminum Smelting Company, Ltd., Osaka and Nihon Atsuen Kogyo K.K., Itami, both of, Japan

Filed Dec. 26, 1978, Ser. No. 973,171
Claims priority, application Japan, Dec. 26, 1977, 52-160651
Int. Cl.[2] B23P 3/06
U.S. Cl. 228—176 15 Claims



1. A continuous casting and cladding apparatus for the production of metal clads comprising:

means having a continuous mold system and cooling means for continuously casting a molten metal, the mold system including a pair of opposed continuous revolving mold surfaces,

at least one uncoiler having rotation restraining means for feeding a sheet or strip of cladding material,

means for adjusting the feed of the cladding material onto at least one surface of a hot solidified cast sheet or strip withdrawn from the casting means, the feed adjusting means including a group of guide rolls and a guide plate and being operable at a variable speed in synchronism with a proper line speed,

an overlaying unit for fitting the cladding material to the hot cast sheet or strip without permitting projection of the cladding material from the edges of the cast sheet or strip,

pinch rolls for feeding the resulting assembly of the cast sheet or strip and the cladding material to a subsequent hot-rolling process, and hot rolls.

11. A method of continuously producing clad aluminum or aluminum alloy comprising the steps of:

continuously feeding molten aluminum or aluminum alloy to one end of a mold space defined by a pair of rolls, a pair of belts, or the combination of a belt and a wheel or of caterpillar type tracks,

withdrawing from the other end of the mold space a cast sheet or strip solidified by cooling and having a temperature of about 300° to about 580° C.,

feeding a degreased cladding material to at least one surface of the cast sheet or strip in synchronism with a proper line speed,

fitting the cladding material to the cast sheet or strip without permitting projection of the cladding material from the edges of the sheet or strip,

preheating the cladding material as properly fitted to the cast sheet or strip in contact therewith, and

hot-rolling the resulting assembly for cladding.

---

4,213,559

## DIVIDED DISPLAY CARTON

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 5, 1978, Ser. No. 893,787
Int. Cl.[2] B65D 5/48
U.S. Cl. 229—16 D 9 Claims

1. An open-topped divided display carton comprising:

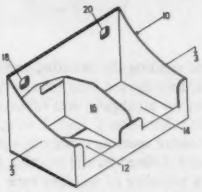
a. a generally rectangular back panel having a pair of hole cutouts formed therein;

b. a reinforcing back panel having a pair of hole cutouts formed therein and adhered to the back panel so that the respective hole cutouts are aligned so that the carton may be suspended therefrom;

c. a pair of side panels each extending forwardly in parallel from the opposite side edges of the back panel, a one of the side panels attached to the back panel and the other of the side panels attached to the reinforcing back panel;

d. a front panel extending between the side panels;

e. a side bottom flap depending from each of the side panels, both side bottom flaps being inwardly folded to be generally perpendicular to the side panels;



f. a bottom panel depending from the front panel and inwardly folded to be generally perpendicular to the front panel, the bottom panel being securely fixed to both of the side bottom flaps;

g. a partition panel extending between the back panel and the front panel, the partition panel being a cutout portion of the reinforcing back panel; and

h. a partition bottom flap depending from the partition panel and extending between the bottom panel and one of the side bottom flaps, the partition bottom flap being glued securely to both the bottom panel and the side bottom flap to make the carton rigid and to fix the partition rigidly in position.

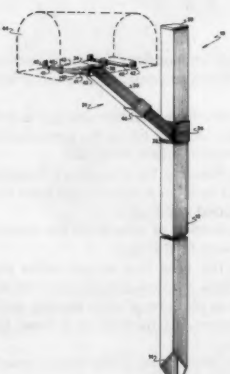
---

4,213,560

## ADJUSTABLE MAILBOX STANDARD

Robert E. Hall, 4187 Mogadore Rd., Kent, Ohio 44240

Filed Jul. 17, 1978, Ser. No. 924,944
Int. Cl.[2] A47G 29/12
U.S. Cl. 232—39 5 Claims



1. A mailbox support assembly, comprising:

a hollow post cut at a bias to form a point at a bottom end thereof for insertion into the ground;

a first collar adjustably mounted upon said post;

a truss obliquely connected to and extending from said collar; and

a support bracket connected to said truss and selectively positionable at an end thereof for receiving and maintaining a mailbox at an end of said truss, said support bracket including a base member connected to said truss and adjustable fingers at opposite ends of said base member for making secure engagement with various sizes of mailboxes.

---

**4,213,561**

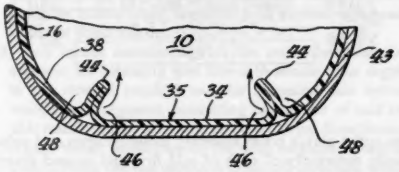
## FLEXIBLE, COLLAPSIBLE CONTAINER FOR BLOOD AND THE LIKE WHICH IS FREE OF LIQUID-TRAPPING FOLDS

**Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Aug. 25, 1978, Ser. No. 937,008**

**Int. Cl.[2] B04B *7/00*; B65D *29/00***

**U.S. Cl. 233—14 R** **9 Claims**




1. In a blood centrifuge system including a centrifuge cup and an elongated, liquid-filled, flat-sealed, flexible, collapsible container positioned within said cup for centrifugation of the liquid in said container, said liquid-filled container within said cup being of essentially the same transverse dimension as said container, said container defining access port means at the end of the container facing outwardly from said centrifuge cup, the improvement comprising, in combination: the inward end opposite to said outwardly-facing end of the container, positioned within said centrifuge cup, defining a first, central end section extending generally perpendicularly to the longitudinal axis of said container, and a pair of second, generally straight end sections, extending from adjacent each end of the first end section and defining obtuse angles to it, said container further defining within said centrifuge cup a pair of inwardly-extending creases located adjacent the ends of said first end section which creases do not trap portions of the contents of said container, said inward end being free of apertures leading to the exterior.

---

**4,213,562**

## PROGRAMMER

**Roger Garrett, 23 rue Lissagaray, and André Liversain, 59 rue Horace Vernet, both of Saint-Etienne, France**

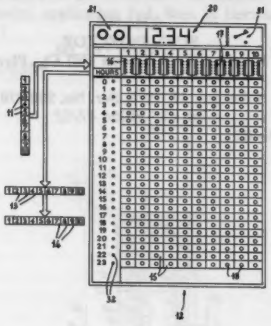
**Filed May 1, 1978, Ser. No. 902,093**

**Claims priority, application France, Apr. 29, 1977, 77 13633**

**Int. Cl.[2] F23N *5/20*; H05B *1/02*; G08B *1/00***

**U.S. Cl. 236—46 R** **22 Claims**

1. A programmer comprising a clock, at least one counter which receives periodically pulses originating in said clock, and a programming matrix including a double-sided printed circuit, on one side of which a first series of parallel conducting strips are provided, each of which is connected to a respective output of said counter and on the other side of which a second series of parallel conducting strips are provided, said second series of strips are non-conductively intersecting said first series being connected to a control circuit for at least one device, a respective aperture in said programming matrix at each nonconductive intersection of a conducting strip of the first series and a conducting strip of the second series for receiving a removable conductive pin which provides an electrical connection between said two sides of the printed circuit, and including a respective conducting area provided on said double-sided printed circuit at each intersection of a conducting strip of said first series and a conducting strip of said second series, at least one of said conducting areas being connected to one of said conducting strips of one of said series by an isolating diode, a respective said aperture being provided at least one of said intersections associated with said diode simultaneously transversing a conducting strip of the other of said series and said conducting area.




---

**4,213,563**

## HEAT STORAGE AND TRANSMISSION APPARATUS FOR HEAT FROM A FLUID HEATED BY THE SUN

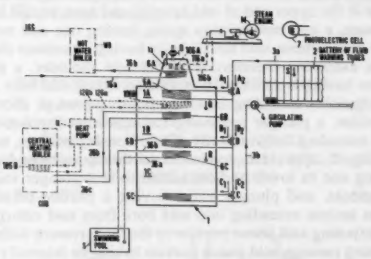
**Josephus P. M. van Kuijk, Blonay, Switzerland, assignor to Patlico Rights N.V., Willemstad, Netherlands Antilles**

**Filed Jul. 10, 1978, Ser. No. 923,315**

**Claims priority, application Netherlands, Jul. 15, 1977, 7707915**

**Int. Cl.[2] G05D *23/00***

**U.S. Cl. 237—2 B** **5 Claims**



1. An installation for storage and transmission of heat of a fluid heated by solar radiation comprising

a closed fluid tank,

at least two primary heat exchange means in said fluid tank, each of said primary heat exchange means being located at ascending levels in said tank to define ascending temperature zones therein,

a pipe system operatively connected to said primary heat exchange means,

a circulation pump in said pipe system for circulating solar heated fluid to and from said primary heat exchange means,

transmission heat exchange means spaced above each primary heat exchange means in each zone in said tank,

said transmission heat exchange means being adapted to transmit heat from the closed fluid tank for utilization purposes,

thermometers in each of said temperature zones, and

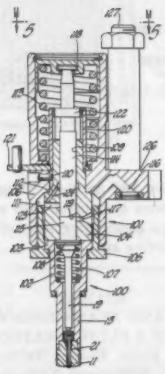
a valve control system operatively connected to said thermometers for controlling the throughflow of the primary heat exchange means in accordance with temperature variations in the closed fluid tank.

---

**4,213,564**
**FUEL INJECTOR**

**Kenneth L. Hulsing, 12619 Beacon Hill Ct., Plymouth, Mich. 48170**

**Filed Jul. 17, 1978, Ser. No. 925,070**
**Int. Cl.[2] F02M *47/02***
**U.S. Cl. 239—88** **7 Claims**



1. A plunger valve nozzle for injecting fuel into an engine cylinder, said nozzle comprising an elongated annular housing having a central passage extending therethrough, means for introducing fuel under pressure to said passage, a nozzle body secured to the lower end of said housing and defining an upwardly facing shoulder within said housing passage, a counterbore in the upper end of said housing and open to said housing passage, a coil compression spring having one end seated in said counterbore, said nozzle body having a constant diameter bore extending therethrough from said shoulder, a plunger valve having a piston portion slidably fitting said bore and an enlargement extending into said housing passage above said shoulder, a plunger retracting rod spacedly disposed within and extending longitudinally of said housing passage, said rod having its upper end connected to the opposite end of said spring and its lower end connected to said plunger valve enlargement, said plunger valve having a portion of reduced cross section extending into said bore from said enlargement for exposing said piston portion to the fuel pressure within said housing passage, said piston portion having an internal passage extending longitudinally thereof and open at its upper end to said housing passage, the opposite end of said internal passage having a connecting orifice extending transversely to the periphery of the piston portion, said orifice being normally closed by said bore but said spring being yieldable in response to a predetermined fuel pressure within said housing passage to accommodate downward displacement of the plunger valve to a position in which at least a portion of said orifice is uncovered by the lower end of said bore.

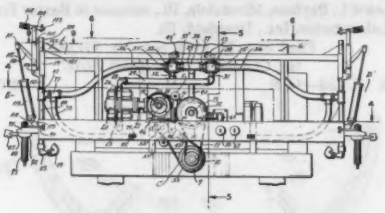
---

**4,213,565**
**SPRAYING SYSTEM**

**Clarence L. Jackson, 819 Caseyville Rd., Caseyville, Ill. 62232**

**Continuation of Ser. No. 776,948, Mar. 14, 1977, abandoned.**
**This application Oct. 12, 1978, Ser. No. 950,789**
**Int. Cl.[2] B05B *1/20***
**U.S. Cl. 239—170** **13 Claims**

1. For use with a vehicle having a source of supply of treatment liquid to be dispensed and a transfer case, a spraying system comprising a single pump for pumping said liquid, said pump being mounted upon said vehicle and being of a variable stroke, positive displacement character and having first and second pistons and associated first and second compartments, said pump having a suction side connected to said source of supply liquid for supplying fluid for pumping by said pistons, means operatively engaging said pump to said transfer case for operation of said pump correspondingly to ground travel of said vehicle, said pump having a discharge side comprising a first outlet port associated with said first compartment and a second outlet port associated with said second compartment, first and second diverter valves, first means connecting said first diverter valve with said first pump outlet port, second means connecting said second diverter valve with said second



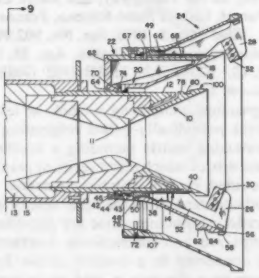
pump outlet port, a boom assembly mounted upon said vehicle laterally outwardly of each of said first and second diverter valves, said boom assembly comprising a spray boom and a manifold for discharging the liquid onto the area to be treated, said manifold being supported by said spray boom, conduit-forming means connecting said first and second diverter valves with the proximate manifold, each of said first and second conduit-forming means including a conduit connected at one end to the associated diverter valve, a vertically disposed pipe mounted on said vehicle, means connecting the other end of each conduit to the related pipe substantially intermediate its length, means connecting each of said pipes at their lower ends to the adjacent manifold, each of said pipes in their portions above the connection to the associated conduit being closed to provide a surge eliminating chamber.

---

**4,213,566**
**NESTED CONE EXTENDIBLE NOZZLE SYSTEM FOR A ROCKET MOTOR**

**Louis E. Miltenberger, Ridgeley, W. Va., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Aug. 25, 1978, Ser. No. 936,995**
**Int. Cl.[2] B64C *15/06***
**U.S. Cl. 239—265.43** **4 Claims**



1. In a rocket motor having a fixed nozzle of the converging-diverging type, the improvement comprising an extendible nozzle cone system comprising:

(a) at least one movable nozzle cone segment having a cylin-

drical section and a conic section, each movable nozzle cone segment being positioned in slidable, concentric and side-by-side (stowed) relationship about the exterior surface of the fixed nozzle, said conic section having the same expansion angle as that of the fixed nozzle, said cylindrical section of said movable nozzle segment having at least two slots spaced equidistantly from each other in the interior surface of the cylindrical section,

(b) at least two rail supports attached to the exterior surface of the rocket motor adjacent the exterior surface of said fixed nozzle, the rail supports being spaced equidistantly from each other and in a parallel relationship with the longitudinal axis of the rocket motor,

(c) drag panels each having a drag surface, a means for attachment to the movable nozzle cone segment, and being designed for sliding engagement with the rail supports, said drag panels corresponding in number to the number of rail supports and being connected to the movable nozzle cone segment, said drag surface extending into the theoretical exhaust path of said fixed nozzle when said movable nozzle cone segment is in stowed relationship with the fixed nozzle,

(d) lock means associated with the movable nozzle cone segment for retaining said movable nozzle cone segment in the stowed position and for releasing said movable nozzle cone segment, permitting movement of said movable nozzle cone segment in response to gas flow from said rocket motor impinging on the drag surfaces of said drag panels along the rail supports in the aft direction until the divergent surface of said fixed nozzle is extended as a substantially continuous surface by the conic section of the movable nozzle cone segment (the deployed position), and

(e) means for retaining the movable nozzle segment in the deployed position.

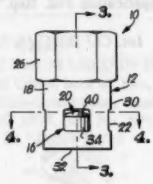
---

**4,213,567**

## DISCHARGE NOZZLE FOR FLUORINATED HYDROCARBON FIRE SUPPRESSION SYSTEM

**Ronald A. McIntire, Blue Springs, Mo., assignor to Fike Metal Products Corporation, Blue Springs, Mo.**

**Filed Dec. 11, 1978, Ser. No. 968,036**
**Int. Cl.² A62C *31/02***
**U.S. Cl. 239—396** **8 Claims**




1. A fluid discharge nozzle comprising:

an elongated, tubular body having structure presenting a fluid inlet and a plurality of circumferentially spaced outlet openings through the sidewall of the body at a point spaced from said inlet;

a fluid flow-directing slug disposed within said body and having a surface means thereon located in simultaneous partial covering relationship to corresponding outlet openings for cooperatively defining, along with said outlet-presenting structure, a plurality of fluid outlet ports of predetermined effective dimensions; and

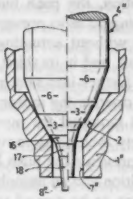
means for removably supporting said slug in said disposition whereby said slug can be removed and be replaced by a different slug of different configuration so as to alter the effective dimensions of respective outlet ports.

**4,213,568**

## FUEL INJECTION NOZZLE

**Karl Hofmann, Neckarrems, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 28, 1978, Ser. No. 881,989**
**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709917**
**Int. Cl.² F02M *61/06***
**U.S. Cl. 239—533.4** **2 Claims**




1. A fuel injection nozzle for internal combustion engines comprising a bored nozzle body having plural merging interior walls of varying inclination including a valve seat and a central injection port, a reciprocable valve needle arranged to be received within said bored nozzle body, said valve needle arranged to open in opposition to fuel flow and against a closing force, said valve seat having a conical shape and adapted to merge into said injection port, said valve needle including a sealing cone adapted to rest on said valve seat in sealing engagement therewith when said nozzle is closed and further including a throttle pin arranged below of said sealing cone for accommodation within said injection port and wherein said throttle pin comprises a plurality of integrated truncated cones tapering inwardly downward with differing tapers from said sealing cone and merging into one another without transition for projection into said injection port when the fuel injection nozzle is closed, the uppermost of said truncated cones extending directly from said sealing cone.

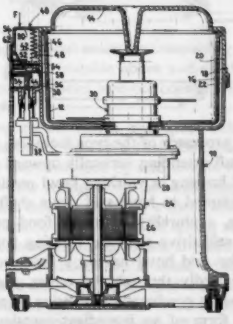
---

**4,213,569**

## DOMESTIC ELECTRICAL APPLIANCE

**Jacques H. J. Amiot, Alencon, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France**

**Filed Mar. 29, 1979, Ser. No. 25,452**
**Claims priority, application France, Apr. 14, 1978, 78-11055**
**Int. Cl.² B02C *18/12, 18/24***
**U.S. Cl. 241—37.5** **8 Claims**



1. A domestic electrical appliance comprising a base, a work bowl carried by the base, a cover for closing the bowl, cooperable means on the base and the cover for removably fixing the cover to the base, said cooperable means being brought into

and out of cooperation upon housed within the base and having an output shaft, a working tool mounted in said bowl and connected to said operable shaft, switch means for operating said motor unit having a movable operating contact, a housing formed in said base, the movable contact of said switch means being received in said housing, and a push button for actuating said movable contact mounted on said cover, said push button being movable so as to occupy first, second and third positions, wherein, in its first, retracted position, the push button is out of engagement with the housing of the movable contact, in its second, cocked position, the push button is engaged in the entrance to the housing so as to prevent rotation of the cover relative to the base without actuating the switch means to operate the motor unit, and in its third, extended position, the push button extends further into said housing so as to actuate the switch means to operate the motor unit, and further comprising a safety lock mounted for movement relative to the push button, the safety lock being movable between a locked position in which it prevents the push button being moved to its first retracted position and an unlocked position in which it allows the push button to be moved to its first position, and elastic means for biassing said safety lock towards its locked position, wherein said safety lock is arranged such that movement of said push button from said first to said second position automatically causes said safety lock to be moved to its locked position by said elastic means.

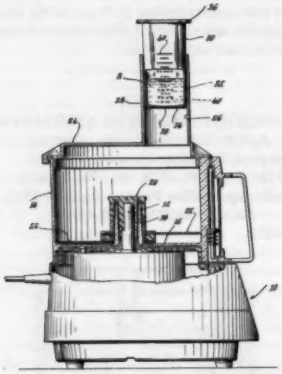
---

**4,213,570**

## FOOD PROCESSOR WITH METERING DISPENSER

**Barbara A. Jones, Saratoga, Calif., assignor to Cuisinarts, Inc., Greenwich, Conn.**

**Filed Oct. 26, 1978, Ser. No. 955,133**
**Int. Cl.[2] B02C *18/22***
**U.S. Cl. 241—38** **5 Claims**



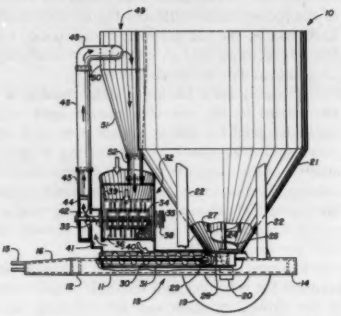
1. In a food processor of the type including a base housing, a tool drive shaft extending vertically upward and being drivable from said housing, a working bowl positionable on said housing and adapted to have said drive shaft extending upwardly therein, a plurality of rotary food processing tools mountable on said drive shaft for rotating within said bowl, and a cover for said bowl having a food-receiving hopper opening downwardly through the cover, the improvement which comprises: a combination metering dispenser and food pusher in the form of an ingredient-containable receptacle having at least a sidewall slidably engageable within said hopper and a bottom wall, said bottom wall defining a dispensing opening therethrough for metering an ingredient from said receptacle into said bowl.

**4,213,571**

## DUST SYSTEM FOR A GRINDER-MIXER

**Duane R. Deardorff, Ephrata, and William W. Mann, Leola, both of Pa., assignors to Sperry Corporation, New Holland, Pa.**

**Filed Apr. 2, 1979, Ser. No. 26,261**
**Int. Cl.[3] B02C *13/288***
**U.S. Cl. 241—48** **13 Claims**



1. In a grinding and mixing apparatus having a mixing container and mixing means mounted therein, grinding means having a top, a first side and an opposing second side, and a dust collector, the improvement comprising:

improved dust collection means having a fan mounted to the first side of the grinding means for generating an air flow and therewith removing finely ground material from the area of the grinding means and transferring it to the dust collector where the material is separated out and fed back into the top of the grinding means in a generally downward vertical path for grinding prior to being delivered to the mixing container.

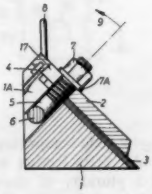
---

**4,213,572**

## BLADE HOLDER

**Wilhelm Pallmann, Zweibrücken, Fed. Rep. of Germany, assignor to Pallmann KG Maschinenfabrik, Zweibrücken, Fed. Rep. of Germany**

**Filed May 17, 1978, Ser. No. 906,990**
**Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722522**
**Int. Cl.[2] B02C *18/18***
**U.S. Cl. 241—292.1** **2 Claims**



1. A blade holder for machine blades, especially for blades arranged in an annular fashion along the periphery of cutting tools, which blade holder comprises in combination: a blade carrier with recess means; a blade supported on said blade carrier; blade holding means detachably mounted on said blade carrier, for holding said blade in position on said blade carrier, said blade holding means at least partially covering said blade while leaving the cutting edge of said blade exposed; and at least one bolt provided with a transverse pin which is rotatably mounted in said blade carrier and having a nut threaded thereon for detachably mounting said blade holding means on

said blade carrier, said blade carrier and blade holding means being provided with recesses for accommodating pivotal movement of said bolt, said blade holding means also having a recess forming a nut passage to allow movement of said nut through said blade holding means without removing said nut from said bolt.

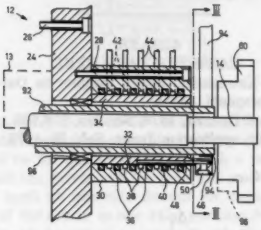
---

**4,213,573**

## AIR COUPLING

**Kurt Schefer, and Jakob Fluck, both of Winterthur, Switzerland, assignors to Reiter Machine Works, Ltd., Winterthur, Switzerland**

**Filed Mar. 7, 1979, Ser. No. 18,103**
**Int. Cl.³ B65H *54/02, 54/40, 67/04***
**U.S. Cl. 242—18 A** **12 Claims**



1. A textile machine comprising a member rotatable about a predetermined axis, and a pressure-fluid coupling for transmitting pressure fluid to and/or from the member, said pressure-fluid coupling comprising, a first part fixed to said member for rotation therewith and a second part co-pending with said first part to define at least one circumferential channel therebetween, said first and second parts being capable of relative rotation,

a pressure-fluid passage in said first part and a pressure-fluid passage in said second part, each passage communicating with said channel to permit transfer of pressure fluid from one passage to the other via said channel,

said first and second parts being arranged for rotation together in at least one direction through a limited angular rotation of said second part, said first part being rotatable through a larger angle in said direction.

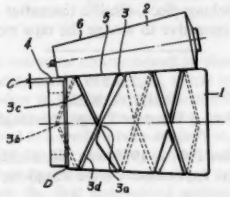
---

**4,213,574**

## GROOVED TRAVERSE DRUM USED IN DRUM WINDER

**Masao Mino, and Takeshi Ohno, both of Yao, Japan, assignors to Kabushiki Kaisha Mino Seisakusho, Osaka, Japan**

**Filed Apr. 25, 1978, Ser. No. 899,721**
**Int. Cl.² B65H *54/48***
**U.S. Cl. 242—43.2** **2 Claims**



1. A grooved traverse drum for use in the winding of yarn into a cone cheese having a large axially extending cone angle thereby forming a large end portion and a small end portion at the opposite ends thereof, said drum including a main, axially extending drum portion having a drum surface which will function as the support for the cone cheese, said main drum portion extending axially substantially the full length of a cone cheese supported thereby, a drum end portion integrally formed with said main drum portion at the end thereof that will be in engagement with the small end portion of the cone cheese, a major portion of the circumferential surface of said drum end portion having a diameter less than the diameter of the main drum portion thereby forming a gap for a major circumferential distance between the surface of the drum end portion and the surface of the small end portion of the cone cheese, and at least two reversely directed, spirally arranged, intersecting traversing grooves in the surface of the main body portion of said drum, with a reversing portion of said traversing groove formed in the non-gap surface of the drum end portion of said drum, which non-gap surface of said end portion of said drum is continuous and even with the surface of said main drum portion, the circumferential surface of said main drum portion being continuous throughout the length thereof except for said grooves therein so as to provide continuous support along substantially the entire length of said cone cheese.

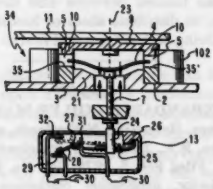
---

**4,213,575**

## PRINTER RIBBON SUPPLY MECHANISM WITH END OF RIBBON DETECT EXPEDIENT WHICH REDUCES RIBBON DRAG

**Rowland V. D. Firth, III, and Willie Goff, Jr., both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 6, 1978, Ser. No. 958,212**
**Int. Cl.³ B41J *35/36*; B65H *25/30***
**U.S. Cl. 242—57** **4 Claims**



1. In a ribbon supply spool structure comprising a supply of ribbon wound on a hub rotatable about and axially movable with respect to a hub receiving member coaxial with said hub, the combination of:

deflectable spring means within said spool hub exerting a force when deflected having a first component of force acting against and restrained by said wound ribbon and a second component acting along said hub axis, and

a spring tensioned member exerting a force along said hub axis in opposition to said deflectable spring means,

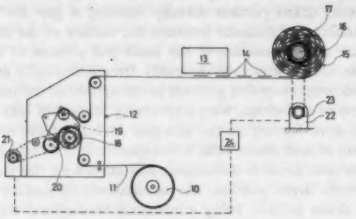
whereby said deflectable spring means and said spring tensioned member are maintained in static equilibrium at a point along said axis so long as said deflectable spring means is restrained by a predetermined minimum of ribbon remaining wound on said hub, and

the axial position of said hub with respect to said hub receiving member at said equilibrium point is such that friction between said hub and said hub receiving member is minimized.

## 4,213,576
## SPOOL MAKING MACHINE

Lars Magnuson, Gräfsnäs Säteri, 46030 Sollebrunn, Sweden

Filed Jun. 4, 1979, Ser. No. 45,135
Claims priority, application Sweden, Jun. 5, 1978, 7806545
Int. Cl.[2] B65H 17/02
U.S. Cl. 242—67.3 R 9 Claims

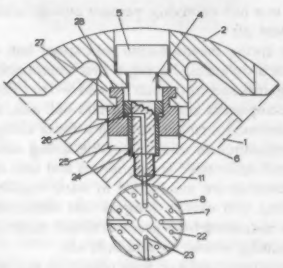


1. A machine for making spools of plastics strip carrying slices of foodstuff and comprising
a first station having means to support
a storage reel for said strip as well as a dispensing device, the latter including
a feed roller and a cooperating pinch roller, said feed roller being mounted in means ensuring a contact pressure between said feed roller and said pinch roller, and
a first power source for driving said feed roller at a constant speed,
a second station, spaced apart from said first station and including
a rotatable shaft having means for removably receiving at least one tubular spool receiving core,
a second power source for driving said shaft at a nominally higher speed than that of said feed roller, and
a slipping clutch transmission between said second power source and said shaft for adjusting the actual speed of said shaft in response to the length of strip feed out by said feeding device, and
a machine located between said first and said second station, to distribute slices of foodstuff upon said strip while being passed from said first to said second station.

## 4,213,577
## EXPANDABLE COILER MANDREL

Hendrik Majoor, Beverwijk, Netherlands, assignor to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Feb. 5, 1979, Ser. No. 9,306
Claims priority, application Netherlands, Feb. 6, 1978, 7801309
Int. Cl.[2] B65H 75/24
U.S. Cl. 242—72 R 7 Claims

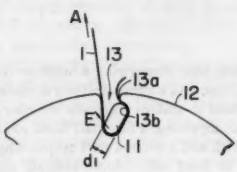


1. In an expandable coiler mandrel, having a core, a plurality of radially expandable segments mounted around the core and, for each segment, a plurality of hydraulic units within the core, each comprising a piston and a cylinder by which the segments are movable radially, these being connected to the hydraulic units with the improvement that the segments are secured to the pistons of said hydraulic units, which pistons are annular and are mounted around pins which are themselves fixed to the core and have heads limiting the radially outward movement of the segments, there being first and second chambers for hydraulic fluid respectively at the radially inner and outer sides of the piston whereby the hydraulic units are operable to cause retraction as well as expansion of the segments, the said first chambers of the hydraulic units, for causing expansion of the segments, being connected to a plurality of pressure cylinders the pistons of which are arranged to be moved in common, and the connections being such that the said first chambers associated with a single segment are respectively connected to at least two different pressure cylinders.

## 4,213,578
## CASSETTE TAPE REEL

Tetsuo Katata, Kawaguchi, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Filed Dec. 29, 1978, Ser. No. 974,500
Claims priority, application Japan, Feb. 24, 1978, 53-20500
Int. Cl.[2] B65H 75/28
U.S. Cl. 242—74 9 Claims



1. A cassette tape reel comprising:
a hub having a cut portion for fastening a tape, and
an elongated, smooth tape locking piece having continuously rounded ends for fastening said tape in said cut portion,
said cut portion being narrow at its entrance portion and wide at its inner portion,
said inner portion having a maximum width which is shorter than the cross sectional length between said rounded ends of each locking piece for wedging said tape against said inner portion by said locking piece,
said inner portion further having along a non-radial direction a maximum dimension longer than said length for inserting said locking piece into said inner portion,
said cassette tape reel being arranged for inserting said tape locking piece into said inner portion so that its length lies along said maximum dimension and then for turning said tape locking piece in order to fasten the tape by wedging it against said inner portion by the said rounded ends of said tape locking piece, tension thereafter applied to said tape being operative to wedge the tape more firmly.

## 4,213,579
## FISHING REEL

Kenneth H. S. Fox, 6 Wardour Lodge, Sunningdale, Berkshire, England

Filed Feb. 7, 1979, Ser. No. 10,023
Claims priority, application United Kingdom, May 24, 1978, 21933/78
Int. Cl.[3] A01K 89/01, 89/02
U.S. Cl. 242—84.2 B 5 Claims

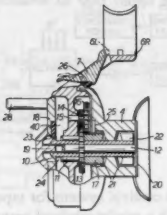
1. A two-speed reel for a fishing rod, comprising:
a housing;
means for mounting the housing on the rod;
a shaft rotatably supported by the housing;

means for rotating the shaft;

a driver mounted on the shaft for rotation therewith, the driver having radial teeth formed on one side thereof;

a gear rotatably mounted on the shaft and having radial teeth formed on one side thereof facing the radial teeth of the driver and spaced a distance therefrom;

gear means coupling the gear to the shaft for rotating the gear at a rate differing from the rotation rate of the shaft in response to a rotation of the shaft;



a spool slidably mounted on the shaft and extending about the radial teeth formed on the driver and the radial teeth formed on the gear, the spool having a portion disposed between the driver and the gear and said portion having radial teeth on one side thereof for engaging the radial teeth of the driver in one axial position of the spool and having radial teeth on an opposite side thereof for engaging the radial teeth of the gear in another axial position thereof; and

means for axially positioning the spool in the shaft.

---

**4,213,580**

## SEATBELT RETRACTOR

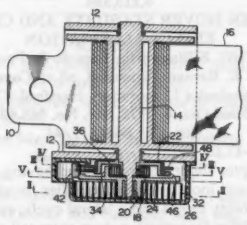
**Takashi Kawaharazaki, Toyoake; Fuminori Teraoka, Toyota; Tatsushi Kubota, Okazaki, and Kenji Matsui, Higashikamo, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Oct. 20, 1978, Ser. No. 952,828**

**Claims priority, application Japan, Oct. 24, 1977, 52-143105[U]**

**Int. Cl.[2] A62B *35/00*; B65H *75/48***

**U.S. Cl. 242—107** **9 Claims**



1. A seatbelt retractor characterized in that: said retractor comprising: spring means comprising a first spring and a second spring weaker in biasing force than the first spring connected in series by a connecting portion to each other and further connected to a seatbelt take-up shaft so as to render the force for winding up the seatbelt; ratchet means comprising a pawl and at least one latch gear provided at the connecting portion between the first and second springs, said pawl for engaging with said latch gear so as to prevent the biasing force of the first spring from acting on the take-up shaft; a friction plate comprising a frictionally contacting means whereby the turning force of said take-up shaft is imparted thereto by said frictionally contacting means so as to engage said latch gear with the pawl; a one way clutch coupled to said take-up shaft; and cam plate means coupled to saod oneway clutch for releasing the engagement of said latch gear with the pawl by the turning force of the take-up shaft at a predetermined position; said frictionally contacting means comprising a pair of projecting resilient members oscillatingly movable relative to the friction plate and capable of rendering the same frictional force to the frictional plate even in the case the rotational direction of the take-up shaft is altered.

---

**4,213,581**

## WIND-UP MECHANISM FOR THE ELIMINATION OF BELT LOOSENESS IN A SAFETY BELT SYSTEM

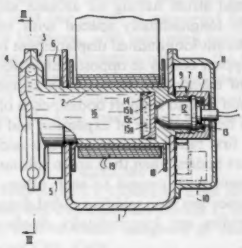
**Rudolf Andres; Helmut Grantz; Günter Abersfelder, all of Sindelfingen, and Gerhard Busch, Gechingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Feb. 1, 1979, Ser. No. 8,571**

**Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805381**

**Int. Cl.[2] A62B *35/00*; B65H *75/48***

**U.S. Cl. 242—107.4 R** **35 Claims**

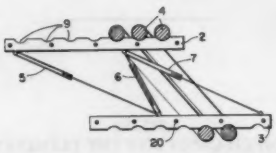


1. A wind-up mechanism for eliminating belt looseness of a safety belt system upon exceeding a predetermined vehicle deceleration, the wind-up mechanism comprising a wind-up roller means, a hollow shaft means, a rotor means coupled with the wind-up roller means, a retraction means coupled with said hollow shaft means for normally urging the wind-up roller means in a belt retraction direction, said wind-up roller means being mounted on said shaft means, and an ignitable propellant charge means arranged in the hollow shaft means for triggering a retraction movement of the wind-up roller means, a fluid medium disposed in front of the propellant charge means which, after the ignition of the propellant charge means, drives the rotor means so as to eliminate a looseness of the belt, characterized in that a cap means is mounted at one end of the hollow shaft means, a toothed rim is connected with the cap means, blocking means are provided for preventing a further belt pull-out by an engagement between the toothed rim and said blocking means, at least part of the roller means is formed-on the hollow shaft means at an end opposite the cap means, the cap means includes an inwardly disposed cup-shaped recess means for accommodating the propellant charge means, a piston means for closing off said recess means and for displacing the fluid medium upon an ignition of the propellant charge means, said cap means and said propellant charge means rotate along during a rotary movement of the hollow shaft means, and in that said propellant charge means is ignitable by an external coil arrangement.

## 4,213,582
## WINDING DEVICE

Peter Rohner, Eschenkamp, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,364
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2751989
Int. Cl.[2] B65H 75/22, 75/26
U.S. Cl. 242—110 1 Claim




1. A device for winding thereabout flexible elongated material, comprising:

first and second elongated support bodies spacially positioned parallel with respect to each other;

a plurality of supporting struts each interconnected between said first and second supporting bodies along their respective longitudinal lengths and forming, in conjunction with said support bodies, a generally cylindrical winding core, each of said struts having an arcuate shape and being sufficiently longitudinally spaced with respect to each other to permit longitudinal displacement of said first and second support bodies in opposite directions; and

a plurality of telescoping means each connected between said first and second support bodies, each of said telescoping means being capable of expansion and contraction to provide a first radial distance between said first and second support bodies when they are in substantial longitudinal alignment with respect to each other, and a second radial distance less than said first radial distance when said support bodies are longitudinally displaced from said alignment;

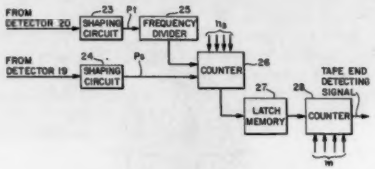
said first support body comprising a plurality of first discrete engaging means spaced longitudinally along its outer surface; said second support body comprising a plurality of second discrete engaging means spaced longitudinally along its outer surface; each of said first and second engaging means being adapted to receive, respectively, first and second surface portions of each of the individual turns of a flexible elongated material helically wound in a single layer about said cylindrical winding core;

whereby each of said first engaging means longitudinally displaces, and reduces the radial distance to the longitudinal axis of said winding core, of that portion of the individual turn it engages as said first support body is longitudinally displaced from substantial longitudinal alignment with respect to said second support body; and each of said second engaging means longitudinally displaces, and reduces the radial distance to the longitudinal axis of said winding core, of that portion of the individual turn it engages as said second support body is longitudinally displaced from substantial longitudinal alignment with respect to said first support body, thus causing each of said individual turns to be tilted toward the longitudinal direction of the winding core so that the overall shape of each of such individual turns is substantially retained, while the helically wound single layer formed of said plurality of tilted individual turns has an increased overall longitudinal length, and a cross-section with a radial axis of reduced length.

## 4,213,583
## REEL DRIVE MOTOR CONTROL SYSTEM FOR CASSETTE/CARTRIDGE TAPE RECORDERS

Akira Mitani, and Isao Sangun, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1978, Ser. No. 928,777
Claims priority, application Japan, Jul. 29, 1977, 52-91735
Int. Cl.[2] G11B 15/54, 15/30
U.S. Cl. 242—186 4 Claims




1. A tape transport control system for tape apparatus including a supply reel with a predetermined amount of tape wound thereon; a take-up reel arranged to wind up said tape as passed thereto from said supply reel, a transducer provided on a tape path between said supply and take-up reels, and means for transporting said tape, said control system comprising:

(a) means coupled with said supply reel and said take-up reel for producing first and second detection signals respectively corresponding to the speed of rotation of said reels, said detection signals being in the form of pulses varying in frequency with the speed of rotation of said reels;

(b) frequency divider means, said frequency divider means having an input and an output, said pulses from said second detection signal being input to said frequency divider means, said frequency divider means dividing said pulses by a predetermined amount $\eta_A$ to produce divided pulses;

(c) counter means responsive to said divided pulses and a predetermined amount $\eta_B$ for counting said pulses from said first detection signal and for producing first control pulses each time the number of said pulses from said first detection signal during one repetition period of said divided pulses exceeds said amount $\eta_B$; and

(d) control means responsive to said first control pulses for controlling said transporting means.

## 4,213,584
## HELICOPTER HOVER STABILITY AND CRUISE GUST EFFECT ALLEVIATION

Franklin A. Tefft, Killingworth; Ricardo L. Perez, Plantsville, and Ronald E. Barnum, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1978, Ser. No. 948,603
Int. Cl.[2] B64C 11/44
U.S. Cl. 244—17.13 3 Claims

1. A helicopter flight control system having a longitudinal cyclic pitch inner loop summing amplifier for summing short-term pitch stability inputs and a lateral cyclic pitch inner loop summing amplifier for summing short-term roll stability inputs, said amplifiers providing corresponding commands to the helicopter control surfaces thereby to stabilize the helicopter in flight, in which the improvement to provide additional positional stability comprises:

a vertical gyro having a pitch axis output and a roll axis output;

a longitudinal accelerometer;

a lateral accelerometer;

means responsive to said longitudinal accelerometer and to the pitch axis output of said vertical gyro for providing a true longitudinal acceleration signal indicative of the horizontal acceleration of the helicopter along its longitudinal axis;

means responsive to said lateral accelerometer and to the roll axis output of said vertical gyro for providing a true lat-

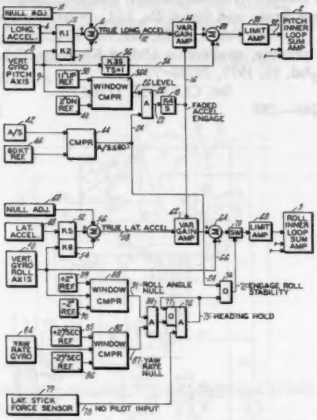
eral acceleration signal indicative of the horizontal acceleration of the helicopter along its lateral axis;

means including an airspeed sensor for providing a signal indicative of the airspeed of the helicopter being below a cruise speed;

means responsive to the pitch axis of said vertical gyro for providing a signal indicative of low helicopter pitch angle;

means concurrently responsive to said below cruise speed signal and said low pitch angle signal for generating a faded acceleration engage signal;

pitch means responsive to said faded acceleration engage




signal and to said true longitudinal acceleration signal for providing a signal input to said longitudinal cyclic pitch inner loop summing amplifier to cause the commanded longitudinal cyclic pitch of the helicopter to be in a direction to countermand the true longitudinal acceleration sensed; and

roll means responsive to said faded acceleration engage signal and to said true lateral acceleration signal for providing a signal input to said lateral cyclic pitch inner loop summing amplifier to cause the commanded lateral cyclic pitch of the helicopter to countermand the true lateral acceleration sensed.

---

**4,213,585**

## MOUNTING SYSTEM FOR A WING MOUNTED AIRCRAFT ENGINE

**Patrick Murphy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed May 22, 1978, Ser. No. 908,074**
**Int. Cl.[2] B64D 27/18**
**U.S. Cl. 244—54** **18 Claims**

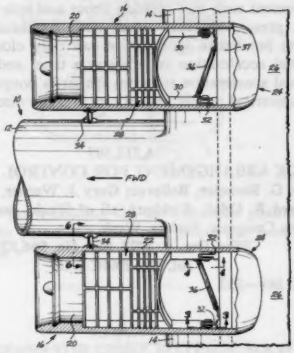
1. In an aircraft having a fuselage, a wing, and at least one engine located adjacent said fuselage, with said at least one engine having a rear portion adjacent said wing and a forward portion extending forwardly from said wing,

an apparatus to mount said at least one engine to said aircraft, said apparatus comprising:

a. a main engine support structure extending along a substantial length of said at least one engine and having a rear portion proximate a leading edge structure of said wing and a forward portion located forward of the wing adjacent the forward portion of the at least one engine,

b. said engine support structure having at its rear portion two laterally spaced mounting members hinge mounted at first and second locations to two laterally spaced hinge mounts on said wing for limited rotation about a horizontally and laterally extending axis of rotation, said engine support structure having no load carrying connection to said wing at any fixed location spaced from said axis of rotation so that said mounting members permit limited up and down swing motion of said support structure relative to said wing,

c. a generally vertically aligned support link having a first end pivotally connected to the forward portion of the engine main support structure at a third support location and a second end pivotally connected to said fuse-




lage, with said support link providing vertical support for said at least one engine at said third location,

whereby said at least one engine is supported from said first, second and third locations, with said wing being able to flex vertically to cause relative rotation between the wing and the engine support structure about said first and second locations, with said support link providing vertical support by transmitting substantially only axial loading into said fuselage.

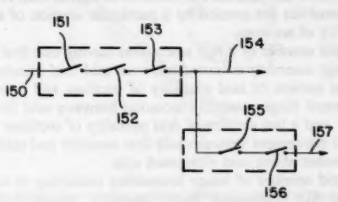
---

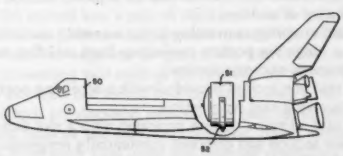
**4,213,586**

## SPIN ACTIVATED SAFETY CIRCUIT FOR SPACECRAFT

**Paul J. Sengstock, Jr., Torrance, and Gerald L. Dutcher, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed May 30, 1978, Ser. No. 910,391**
**Int. Cl.[2] B64G 1/00, 1/10**
**U.S. Cl. 244—158** **2 Claims**



1. A safety circuit for a spacecraft which is adapted for being launched from a shuttle by means which impart rotational motion about a spin axis as well as translational motion to the

spacecraft, said safety circuit being operative for interlocking electrical power to rocket motor arm and fire circuits and includes at least one separation switch series coupled to the path of electrical power to said arm and fire circuits, said separation switch being mounted on said spacecraft such that the electrical path through said separation switch is completed upon disengagement between the spacecraft and the shuttle and wherein the improvement comprises at least two rotational acceleration switches mounted on respective opposite sides of said spacecraft and having their respective acceleration sensing axis oriented such that rotation about said spin axis at greater than a preselected rate closes both rotational acceleration switches but linear acceleration can only close one of said rotational acceleration switches at a time, and wherein said rotational acceleration switches are series coupled in the path of the electrical power to said arm and fire circuits.

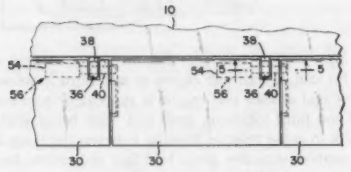
---

**4,213,587**

## HINGE ARRANGEMENT FOR CONTROL SURFACES

**William G. Roeseler, Bellevue; Gary J. Warner, Issaquah, and Richard B. Odell, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Dec. 4, 1978, Ser. No. 966,529**
**Int. Cl.[2] B64C 9/02**
**U.S. Cl. 244—213** **7 Claims**




1. A hinging arrangement for pivotally joining a first structural member to a plurality of sections positioned adjacent to one another and forming a second structural member disposed next to said first member, for relative movement between said first member and said second member about one elongated axis and for allowing relative restrained flexibility between each said adjacent sections of said second member, comprising in combination;

(A) a number of hinge assemblies, being one more in total than said plurality of sections, mounted between said first member and said second member so that at least two hinge assemblies are carried by a particular section of said plurality of sections,

(B) said number of hinge assemblies having one first general hinge assembly mounted between said first member and a first section of said plurality of sections and one second general hinge assembly mounted between said first member and a last section of said plurality of sections for pivotal movement between said first member and said second member about said elongated axis,

(C) said number of hinge assemblies including at least one coupling restraining hinge assembly mounted between said first member and one section and interconnected between said one section and an adjacent section of said plurality of sections,

(D) said coupling restraining hinge assembly including;

(1) a hinge lug portion projecting from said first member towards said one section,

(2) said one section provided with a receiving portion for receiving said lug portion,

(3) said adjacent section provided with a slot facing said one section and disposed substantially perpendicular to said elongated axis,

(4) a shear key projecting from said one section at a predetermined spacing from said elongated axis, at a location opposite of said slot, and protruding into said slot, and

(5) a pin disposed in said receiving portion and positioned substantially coaxially with said elongated axis and extending into said slot, for pivotally connecting said first member to said one section and pivotally coupling said adjacent section to said one section while simultaneously restraining said one section to said adjacent section by said shear key inside of said slot.

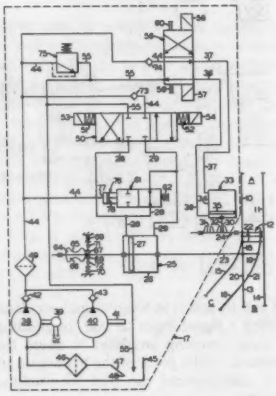
---

**4,213,588**

## FLUIDICALLY OPERATED RAILWAY SWITCH MACHINE

**Colin M. Bowles, Wootten Bassett, England, assignor to Westinghouse Brake and Signal Co. Ltd., Wiltshire, England**

**Filed Feb. 1, 1978, Ser. No. 874,298**
**Claims priority, application United Kingdom, Feb. 3, 1977, 4375/77; Jul. 15, 1977, 29769/77**
**Int. Cl.[2] B61L 11/06**
**U.S. Cl. 246—259** **16 Claims**



1. A railway switch machine comprising, fluidically actuating means for switching movable points of rails between two extreme positions, valve means coupled to said fluidically operated actuating means for selectively controlling fluid flow in a pair of passageways each of which is coupled to opposite sides of a pressure differential responsive movable member of said fluidically operated actuating means whereby when said valve means connects a source of fluid pressure to said passageways between said opposite sides of said fluidically operated actuating means so that a fluid pressure differential is established across said pressure differential responsive movable member to operate said fluidically operated actuating means to thereby switch the movable points of the rails from one extreme position to the other extreme position and when said valve means interconnects said passageways between said opposite sides of said fluidically operated actuating means fluid is directly exchanged between either side of said movable member such as to permit the movable points of the rails to be moved from one extreme position to the other extreme position by the passage of a railway vehicle trailing the movable points, said valve means includes an integrally formed bypass and directional valve means having a movable valve member which is adapted to assume a first position of the movable valve member to establish a fluid passage between opposite sides of said pressure differential responsive movable member whereby to permit said exchange of fluid between opposite sides of said pressure differential responsive movable member and which is adapted to assume another position of the movable valve member to prevent direct fluid connection between opposite sides of said pressure differential responsive movable member, and resiliently-loaded latching means cooperatively associated with said fluidically operated actuating means for

latching the movable points of the rails in either of the two extreme positions so that the springiness of the movable points or vibration caused by passing railway vehicle is incapable of causing the movable points of the rails to assume an intermediate position between the two extreme positions.

---

**4,213,589**

## CLAMP FOR SECURING ROUND ARTICLES

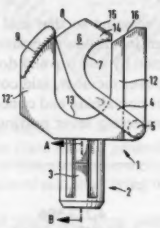
**Claude Pierron, St. Ismier, France, and Johannes Kirchgaesser, Steinen, Fed. Rep. of Germany, assignors to A. Raymond, Loerrach, Fed. Rep. of Germany**

**Filed Aug. 14, 1978, Ser. No. 933,622**

**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740376**

**Int. Cl.² F16L *3/08*; A44B *21/00***

**U.S. Cl. 248—74 R** **12 Claims**



1. A clamp for securing a generally round article to a support comprising:

a generally channel-shaped body having a base and a pair of legs spaced one from the other and defining an opening therebetween,

a clip having a clamping head including a first surface for engaging the article to retain the article in said clamp, and

a resilient, twistable pin integral with said clip for pivotally mounting said clip to said body for movement through at least part of said opening and between a position for retaining the article in the clamp and a position for opening the clamp to receive the article in or remove the article from the clamp, the resiliency of the pin biasing the clip toward the article-retaining position,

one of said legs having a surface portion in opposition to said head when said head retains an article in said clamp, said head having a second surface engageable with the surface portion of said one leg in response to a force on the article engaged by said clamping head surface in a direction away from said base and outwardly of said opening, thereby tending to flex the resilient pin, to retain the clip substantially in its article-retaining position.

---

**4,213,590**

## HITCH HEAD HAVING MANUAL JAW UNLOCK

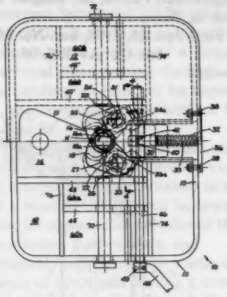
**Ronald D. VanDyke, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.**

**Filed Feb. 26, 1979, Ser. No. 15,560**

**Int. Cl.² B60P *7/00***

**U.S. Cl. 410—64** **9 Claims**

1. A hitch head comprising a pair of pivotable jaws which hold in place a kingpin of a highway trailer; a horizontally movable lock block biased by a resilient means to closed position, engaging the jaws and holding them in closed position, and adapted to maintain a kingpin of a highway trailer in place; said lock block being movable to an open position by a finger extending through an opening in said lock block; said finger rigidly attached to a horizontally extending operating shaft which is rotatably mounted and adapted to move said finger to an overcenter position holding the locking block in open position; said finger including a transversely extending protrusion which is engaged by said jaws as the kingpin exits to pivot said finger from said overcenter position, and allows said lock block to move to an intermediate position engaging the rear



portion of the jaws, holding the jaws in open position until another kingpin enters the jaws and pivots the jaws to said closed position.

---

**4,213,591**

## JOINT MEANS FOR LIGHT FITTINGS, SUCH AS OFFICE LAMPS

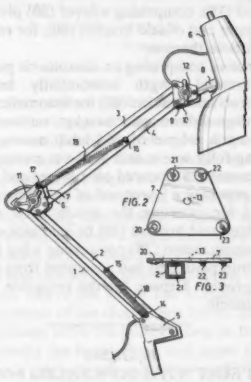
**Aarno Jaakkola, Porvoo, Finland, assignor to Oy Lival AB, Nickby, Finland**

**Filed Feb. 1, 1978, Ser. No. 874,091**

**Claims priority, application Finland, Jul. 12, 1977, 772171**

**Int. Cl.² F16M *13/00***

**U.S. Cl. 248—281.1** **9 Claims**

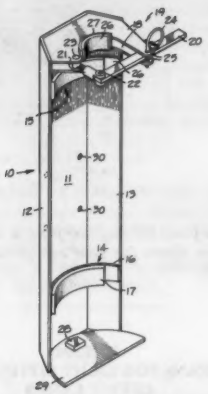


1. A support device for a light fitting, comprising a pair of first and second bars disposed side-by-side and substantially parallel to each other with an end of the first bar adjacent an end of the second bar, a pair of third and fourth bars disposed side-by-side and substantially parallel to each other with an end of the third bar adjacent an end of the fourth bar, and joint means connecting said ends of the first and second bars to said ends of the third and fourth bars and comprising a pair of joint plates which are disposed substantially parallel to each other with said ends of the bars therebetween, fixing members extending from each joint plate and entering respective holes in the side surfaces of the bars, and clamping means extending through the joint plates to adjust the rigidity of the connection established by the joint means, at least one of said fixing members consisting of a protuberance on the surface of a joint plate.

## 4,213,592
## BRACKET ASSEMBLY FOR MOUNTING FIRE EXTINGUISHERS THEREON

Daniel J. Lingenfelser, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1978, Ser. No. 918,232
Int. Cl.[2] A47K *1/08*
U.S. Cl. 248—313 5 Claims



1. A bracket assembly adapted to mount a tubular article thereon comprising

a bracket (10) comprising a back plate (11) having a bottom plate (29) secured thereto and defining a mounting recess adapted to have an article (F) at least partially disposed therein;

latch means (19), comprising a lever (20) pivotally mounted on an upper end of said bracket (10), for releasably retaining an article thereon,

kick-out means, comprising an elastomeric pad (26) having a circumferential length substantially less than 180°, mounted on said bracket (10) for automatically ejecting an article disposed on said bracket outwardly from said bracket upon release of said latch means, said lever (20 extending fully across said kick-out means (26), and

retaining means (28) secured on a lower end of said bracket (10) for retaining a lower end of an article on said bracket (10) and for releasing the article upon ejection of the article from said bracket (10) by said kick-out means (26), said retaining means (28) comprising a lug (28) secured on said bottom plate (29) and separated from said back plate (11) to provide a space for the reception of a rim of an article therein.

---

## 4,213,593
## AIRCRAFT SEAT WITH CONCEALED LOCKING AND RELEASING MECHANISM

Kirby B. Welk, Litchfield, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Filed May 25, 1979, Ser. No. 42,981
Int. Cl.[2] B65I *1/22;* A62B *35/00*
U.S. Cl. 248—501 1 Claim

1. In combination,

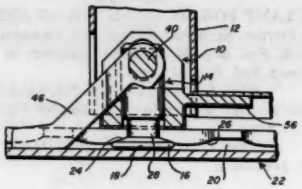
a track member secured to the floor of a vehicle such as an airplane, said track member having a longitudinally extending slot communicating with an interior channel,

a cover member including a top portion and a pair of downwardly projecting ribs having means at the bottom thereof for latchingly engaging the bottom edge of said slot, and

a vehicular seat which is to be releasably secured to said track member comprising

a leg, and

a locking assembly secured thereto including a pivotally mounted control lever selectively displaceable from an elevated release portion to a lowered locking position, said lever, when at said locking position having a portion projecting upwardly above the track member, said upwardly projecting portion having a width and height



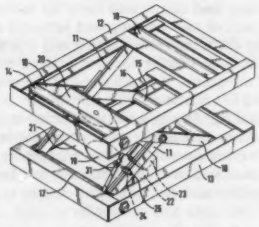
of elevation selected so that said upwardly projecting portion when in the lower position will fit within the volume defined by said top and downwardly projecting ribs of said cover member, said cover member comprising means for containing and concealing from view said upwardly projecting lever portion.

---

## 4,213,594
## VEHICLE SEAT

Helge Pietsch, An der Wasserbrede 21, 4930 Detmold-Lossbruch, and Gerd Lange, Hünnefeldstrasse 10, 4950 Minden, both of Fed. Rep. of Germany

Filed Nov. 28, 1978, Ser. No. 964,122
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753105
Int. Cl.[2] A01K *97/10*
U.S. Cl. 248—550 10 Claims

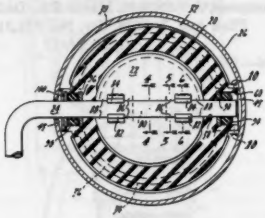


1. A spring loaded vehicle seat including a seat frame for supporting a seat cushion, an underframe, levers arranged on the seat frame, a pneumatic spring, the seat frame being supported on the underframe by the levers and the pneumatic spring, a selected static height of the seat being automatically maintained constant independent of the weight of the occupant of the seat at any one time, a compressed air blow-off valve for decreasing the internal working pressure of the pneumatic spring in positions of the seat above the static height during vibrations, a compressed air supply valve for increasing the internal working pressure of the springs in positions of the seat below the static height, a switch mechanism for opening and closing the valves, and a coupling device coupled to transmit vibrational movement of the seat to the switch mechanism, wherein the switch mechanism is fixed in its respective end position after the opening of a valve and the coupling device includes a lagging segment x so that movement of the switch mechanism after the opening of a valve lags behind the vibrational movement by the extent of the lagging segment x.

## 4,213,595
## BUTTERFLY VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Continuation of Ser. No. 779,269, Mar. 18, 1977, abandoned, which is a division of Ser. No. 661,132, Feb. 25, 1976, Pat. No. 4,111,395, which is a continuation of Ser. No. 490,232, Jul. 22, 1974, abandoned. This application May 4, 1978, Ser. No. 902,829
Int. Cl.² F16K 1/22
U.S. Cl. 251—308 6 Claims

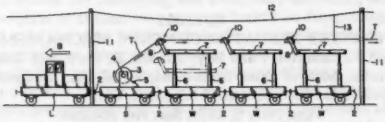


1. In a butterfly-type valve:
a generally flat valve plate having generally parallel faces;
an actuating shaft of circular cross-section for said valve plate, the center axis of said shaft lying between the planes of said faces;
a projection formed integrally from said valve plate and extending from one of said faces at least partially around said shaft to assist in mechanically locating and retaining said shaft with respect to said valve plate,
said projection being less in width, taken along said axis, than the width of said valve plate along the same axis, the edges of said projection defining said width lying in planes extending generally transversely to said axis;
locating and sealing portions integral with said valve plate and disposed between the planes of said faces for minimizing gaps between said shaft, projection and valve plate, each said portion including a surface which is generally perpendicular to said planes and engages said shaft immediately adjacent to one of said edges of said projection; and
brazing metal disposed within all the interstices between said valve element, projection and shaft for interconnecting same in a leakproof manner.

## 4,213,596
## WHEELED, OVERHEAD WIRE INSTALLING APPARATUS

Motozo Inoue; Mitsuzo Kumeta; Hideo Ueno; Yoshinao Okamura, and Tadashi Suzuki, all of Utsunomiya, Japan, assignors to Fuji Jokogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1979, Ser. No. 17,016
Claims priority, application Japan, Oct. 30, 1978, 53-132648
Int. Cl.² B65H 59/00
U.S. Cl. 254—134.3 R 5 Claims



1. A wheeled, overhead wire installing apparatus comprising a wire stretching car rotatably supporting a drum around which an overhead wire is wound, at least one work car coupled to the rear of the wire stretching car, and locomotive means for driving the above mentioned cars, each work car having a raisable and lowerable work platform which is provided at the front end thereof and substantially on the longitudinal centerline of the work car with an overhead wire guide roller device adapted to guide the overhead wire drawn out of the drum, said wire guide roller device comprising:
a cradle;
a plurality of transverse horizontal guide rollers rotatably supported on the cradle in positions to form in the cradle a curved horizontal guide surface of a large radius of curvature in a vertical plane passing through said centerline such that a bending set will not be imparted to the overhead wire, the horizontal guide surface bearing the wire in rolling contact;
a plurality of vertical guide rollers rotatably supported on the crade in positions to form two opposed vertical guide surfaces having a large radius of curvature in a horizontal plane such that a bending set will not be imparted to the wire and disposed on opposite lateral sides of the wire thus borne on the horizontal guide rollers; and
support means swingably supporting the cradle on the work platform by means of pivot pins having a common transverse horizontal axis and passing through the cradle at a part thereof higher than the horizontal guide rollers, whereby the cradle is stably supported and automatically adapts to an optimal attitude relative to the wire thereby to prevent bending sets therein.

## 4,213,597
## CLOTHES LINE SEPARATOR

Ross H. Rayner, Box 687, Sicamous, British Columbia, Canada (V0E 2V0)

Filed Jun. 19, 1978, Ser. No. 916,875
Int. Cl.² B66D 1/36
U.S. Cl. 254—388 11 Claims

1. A retainer for endless clothes lines extending around spaced pulleys and having generally parallel upper and lower runs, said retainer comprising an elongate frame, an upper channel on an upper end of the frame, a pulley in the channel, and positioned to ride on the upper run of a clothes line extending across the frame and through the channel, said channel having an entrance facing downwardly relative to the frame, and a releasable clamp adjacent a lower end of the frame, said clamp being movable from a first position, where it can grip the lower run of said clothes line extending across the frame, to a second position, where the lower line is released, whereby longitudinal movement of the clothes line lower run, when it is gripped by said clamp, shifts the pulley riding on the line upper run and consequently the frame along said upper run, and said clamp comprises a gate extending from an end of said downwardly facing entrance of said upper channel and substantially along the length of said elongate frame so that when said clamp is in said first position said clamp retains said upper run in said upper channel, and when said clamp is in said second position said clamp permits the release of said upper run from said upper channel.

## 4,213,598
## COMPACT SANITARY KIT PACKAGE

Peter R. Halasz, Los Angeles, Calif., assignor to Bergen-Brunswig Corporation, Los Angeles, Calif.

Filed Dec. 13, 1978, Ser. No. 968,748
Int. Cl.² B65D 5/10, 5/06
U.S. Cl. 206—45.14 13 Claims

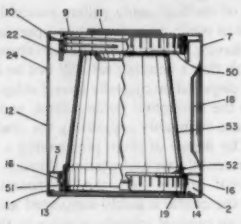
1. A specimen container package comprising,
top panel means,

first component retaining panel means joined to one edge of said top panel means and including first locking means for locking said top panel means and said first component retaining panel means in parallel overlapping relationship,

first and second side panel means joined to opposite edges of said top panel means to form sides of said package,

one of said first and second panels having an aperture therein,

bottom panel means joined to one of said first and second side panel means,



first tab panel means connected to an edge of said one of said first and second side panel means for insertion into said aperture in said one side panel means, and

second component retaining panel means joined to said bottom panel means and including second locking means for locking said bottom panel means and said second component retaining panel means together in parallel relationship.

---

**4,213,599**

## APPARATUS FOR THE PRODUCTION OF ALUMINIUM

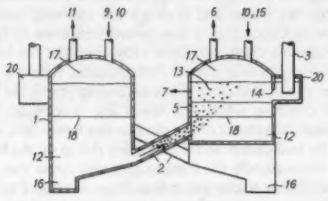
**Ernest W. Dewing, Arvida; Jean-Paul R. Huni, Kingston; Raman R. Sood, Arvida, and Frederick W. Southam, Kingston, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada**

**Division of Ser. No. 799,762, May 23, 1977, Pat. No. 4,099,959. This application May 26, 1978, Ser. No. 909,987**

**Claims priority, application United Kingdom, May 28, 1976, 22474/76**

**Int. Cl.² F27B *3/08***

**U.S. Cl. 266—166** **18 Claims**



1. Apparatus for the production of aluminium metal by the direct reduction of alumina by carbon comprising four sequentially arranged chambers adapted to receive and contain a body of molten slag composed of alumina and combined carbon in the form of at least one of aluminium carbide and aluminium oxycarbide, means for supplying carbon feed material to the first and third chambers, flow conduits for said slag from said first and third chambers to said second and fourth chambers respectively, each of said flow conduits having an upwardly directed outlet end portion, return conduits for said slag respectively leading from a lower region in each of said second and fourth chambers to said third chamber and said first chamber respectively, said return conduits, when filled with molten slag, constituting relatively lower electrical resistance paths than said flow conduits, means for supplying alumina feed to at least one of said chambers, spaced electrode means arranged to contact said slag for passage of electric current through said slag, means for discharging gas from each of said four chambers and means for collecting and discharging Al metal from said second and fourth chambers, said electrode means being arranged so that the electric current flows in each flow conduit in series with a return conduit.

---

**4,213,600**

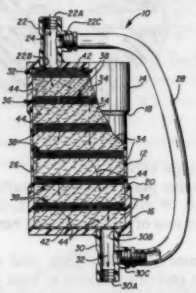
## SILVER RECLAMATION APPARATUS

**Roy R. Thompson, Jr., 6520 N. Haven Rd., Dallas, Tex. 75230**

**Filed Aug. 7, 1978, Ser. No. 931,317**

**Int. Cl.² C22B *11/12***

**U.S. Cl. 266—170** **4 Claims**



1. Apparatus for recovering silver from a liquid solution containing dissolved silver compounds comprising, in combination:

a vessel having an inlet port for receiving said liquid solution, a discharge port for removing effluent solution from said vessel, and an enclosure portion defining a flow path from said inlet port to said discharge port;

means partitioning said flow path into adjoining flow path regions;

a fluid permeable layer of metal and a fluid permeable layer of filter material disposed in alternate ones of said flow path regions, respectively, each metal layer consisting of a metal which is more electropositive than silver in the electromotive series, and each filter layer consisting of a chemically inert fibrous material which is substantially non-reactive to said liquid solution;

said partitioning means defining first, second and third adjoining flow path regions, said fluid permeable layer of metal being disposed in each of said first and third flow path regions, and said fluid permeable layer of filter material being disposed in said second flow path region, the metal layers in said first and third regions consisting of first and second metals, respectively, each of said metals being electropositive with respect to silver, and each occupying relatively different positions in the electromotive series, respectively.

---

**4,213,601**

## PRINTER ELEVATOR CONTROL MECHANISM

**Joseph F. Cattorini, Palm Bay; Thomas R. Park, and John K. Martin, both of West Melbourne, all of Fla., assignors to Documation Incorporated, Melbourne, Fla.**

**Filed Nov. 6, 1978, Ser. No. 958,014**

**Int. Cl.² B65H *45/00***

**U.S. Cl. 270—61 F** **9 Claims**

1. A printer elevator control in a web refolding mechanism comprising in combination:

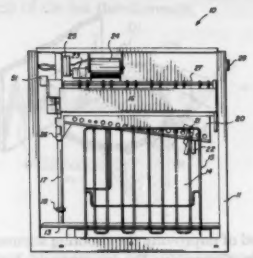
an elevator frame movable in response to the operation of a printer toward and away from a stack of refolded paper in a stacking bin;

a printer guide chute for feeding paper into said stack, said

paper guide chute being attached to said elevator frame for feeding paper therethrough into said stacking bin;

a pair of paper control flappers each movably mounted to said elevator frame adjacent said paper guide chute for directing paper into alternate folds in the stacking bin;

switch means mounted adjacent one of said paper control flappers and actuated by said paper control flapper being



hit by stacking paper for sensing the movement of folds in said web past said guide chute, said switch means generating signals responsive to movement of said one paper control flapper; and

means to move said elevator frame responsive to signals from said switch means, whereby a printer elevator can be raised in accordance with the height of stacked paper.

---

**4,213,602**

**SWITCHING DEVICE FOR LETTERS AND THE LIKE**

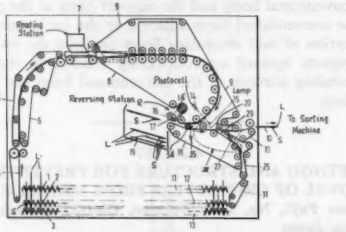
**Cornelis Kuijt, Katwijkaan Zee, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands**

**Continuation of Ser. No. 748,477, Dec. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 590,625, Jun. 26, 1975, abandoned. This application Jun. 9, 1978, Ser. No. 914,068**

**Claims priority, application Netherlands, Jul. 16, 1974, 09617**

**Int. Cl.[2] B65H** *29/60*

**U.S. Cl. 271—279** **2 Claims**




1. A system for conveying and selectively delivering letter-type objects to at least two separate locations, comprising:

(A) a driven stem belt conveyor for conveying said letter-type objects along a first path to a location having a receptacle for accumulating said letter-type objects,

(B) a driven branch belt conveyor below said driven stem belt conveyor for conveying said letter-type objects along a second path to another location, which second path extends in an opposite direction to said first path,

(C) a switching device located along said first path to said receptacle and immediately adjacent thereto and operable to switch selectively said letter-type objects from said first path to said second path, said switching device comprising a one-rotation means adjacent said branch belt conveyor, said one rotation means having an incomplete cylindrical surface of which the non-cylindrical part is normally out of said first path of said letter-type objects moved by said stem belt conveyor, and of which the cylindrical surface part serves for engaging said letter-type objects to pinch them downward into contact with said opposite moving branch belt conveyor for conveying said objects to said other location,

(D) photoelectric means for sensing the trailing edges of said letter-type objects as they move along said stem belt conveyor toward said switching device, and

(E) a one-rotation coupling means driving said one-rotation means under control of said sensing means for rotation of said one-rotation means in said opposite direction to move said letter-type objects in the same direction as said branch belt conveyor, whereby whenever the space between two successive letter-type objects is small or the letter-type objects overlap one another said switching device is not rotated so that the non-cylindrical part allows free passage of said letter-type objects to said receptacle.

---

**4,213,603**

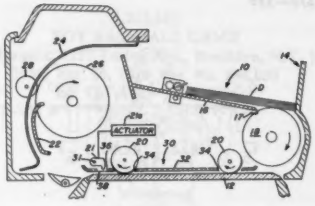
**METHOD AND APPARATUS FOR LOCATING A MOVING SHEET AT A REGISTRATION POSITION**

**Robert M. Peffer, Penfield, and Charles H. Braun, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 15, 1978, Ser. No. 915,646**

**Int. Cl.[2] B65H** *9/14*

**U.S. Cl. 271—229** **12 Claims**




1. Apparatus for locating a sheet, moving along a travel path defined by a guide and a parallel support, at a registration position in said path, one surface of such sheet being disposed substantially parallel to said support during sheet movement, said apparatus comprising:

resilient means selectively movable into said path upstream of said registration position for applying a deceleration force to such surface, urging such sheet against said support, to retard such sheet approaching said registration position; and

means for moving said resilient means into and out of said path so that said resilient means engages such sheet when said resilient means is in said path to locate such sheet at said registration position, and disengages such sheet when said resilient means is out of said path whereby further movement of such sheet along said path is unimpeded.

---

**4,213,604**

**AUTOMATIC ORIGINAL HANDLING DEVICE**

**Tadashi Sato, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 6, 1978, Ser. No. 922,294**

**Claims priority, application Japan, Jul. 19, 1977, 52-86203; Jul. 19, 1977, 52-86204**

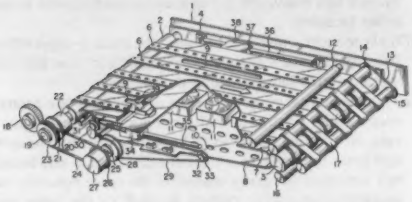
**Int. Cl.[2] B65H** *9/10*

**U.S. Cl. 271—233** **13 Claims**

1. An automatic original handling device for automatically

conveying sheet originals to the original carriage surface of a copying apparatus, comprising:

belt conveyor means including intermittently movable belt means trained around at least two rollers;



registration means, movable along said belt means when said belt means is not moving, for registering an original on said belt conveyor means so that the original is conveyed accurately to a predetermined position on the original carriage surface; and means for adusting the position of said registration means.

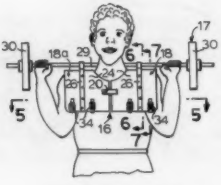
---

**4,213,605**

**NECKBONE AND SHOULDER PROTECTIVE APPAREL FOR BARBELL LIFTERS**

**Walter G. McPeak, 3505 Kilkenny West, Tallahassee, Fla. 32303**

**Filed Feb. 8, 1978, Ser. No. 876,122**
**Int. Cl.[2] A63B *21/12***
**U.S. Cl. 272—119** **3 Claims**



1. A neck and shoulder protective apparel (16) for lifters of a barbell assembly (17) during squat exercises, said assembly including a shaft (29) having at least one weight member (30) mounted on each of its opposite end portions, said apparel comprising:

(a) a cushioned layer (23) adapted to fit over each of the lifter's shoulders, the opposite end portions of each layer extending downwardly over the front and back trapezius and deltoid muscle areas (14, 15) of its associated shoulder;

(b) a pair of inverted U-shaped rigid shields (18, 18*a*) covering said layers respectively;

(c) means (26, 26) carried by said shields for jointly supporting the intermediate portion of said shaft (29) with said weight members (30) thereon adjacently behind the lifter's neck, above his neckbone (12), and substantially parallel to and above the crests of his shoulders, the opposite end portions of said shaft axially projecting sidewise beyond the shoulders and within gripping range of the lifter's hands;

(d) means (35, 36) for fixedly securing each of said downwardly extending back end portions of said layers (23, 23) to the proximate face of the associated shield, and

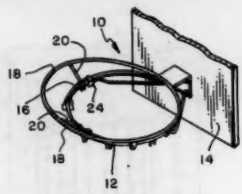
(e) means (33, 34) for slidably adjusting a detached, downwardly extending front end portion of each of said layers relative to the proximate face of its associated shield, said adjusting means including a flexible member being attached at one end to one layer and the opposite end being attached to the associated shield.

**4,213,606**

**DEVICE TO IMPROVE SHOOTING A BASKETBALL**

**Robert E. Wilson, 636 E. Main, Mulvane, Kans. 67110**

**Filed Apr. 2, 1979, Ser. No. 26,035**
**Int. Cl.[2] A63B *63/00, 69/00***
**U.S. Cl. 273—1.5 A** **5 Claims**



1. A method of improving the shooting accuracy of a basketball player by eliminating the tendency to bury the ball between the backboard and the hoop at the underside thereof comprising the step of:

(a) positioning a secondary hoop of larger diameter relative to the conventional hoop so that the secondary hoop is tangential and co-planar with the conventional hoop and a support hoop at the point on the conventional hoop and support hoop adjacent to the backboard and so that the portion of the secondary hoop opposite the backboard projects upward and outwardly relative to the corresponding portion of the conventional hoop and the support hoop whereby the shooter is encouraged to bank the basketball from an optimum position on the backboard.

2. A basketball training device for a conventional basketball hoop and backboard assembly wherein said conventional hoop is normally positioned in a horizontal plane comprising:

(a) a support hoop of essentially the same diameter of the conventional hoop to circumferentially mate with same;

(b) a secondary hoop of larger diameter relative to the conventional hoop;

(c) interconnecting means for attaching said support hoop to said secondary hoop;

(d) means for removably connecting said support hoop to said conventional hoop;

said secondary hoop being tangential and co-planar with the conventional hoop and the support hoop at the point on the conventional hoop adjacent to the backboard, and a portion of said secondary hoop opposite the backboard projects upward and outwardly relative to the corresponding portions of the conventional hoop and support hoop.

---

**4,213,607**

**METHOD AND STRUCTURE FOR PREVENTING REMOVAL OF GRIP COVERS FROM METALLIC BATS**

**Hirokazu Fujii, No. 19-9, 2-chome, Obiraki, Fukushima-ku, Osaka, Japan**

**Continuation-in-part of Ser. No. 620,215, Oct. 6, 1975, Pat. No. 4,090,709. This application May 10, 1978, Ser. No. 905,280**
**Claims priority, application Japan, Jan. 11, 1978, 53-2201**
**Int. Cl.[2] A63B *59/06*; B21D *39/00*; B23P *11/00***
**U.S. Cl. 273—72 A** **3 Claims**

1. In a hollow tubular metallic bat having a grip cover made of hard rubber or the like covering the grip of the bat, said grip cover having an enlarged grip end, the improvement whereby the grip of the bat is prevented from flying out of the grip cover upon swinging of the bat, comprising:

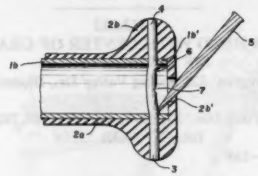
at least one pin or cotter penetrating through said grip end of said grip cover and said grip, said pin being physically deformed at the center thereof between the inside wall portions of said grip, the portion of the pin between the inside wall portions of said grip thus being bent to prevent removal of the pin, and said pin being further deformed, to

further prevent removal of the pin, by calking to the inside wall of said grip.

3. A process for producing a metallic bat in accordance with claim 1, comprising:

covering the grip of the bat with a grip cover made of hard rubber or the like and having an enlarged grip end;

drilling a hole through the grip end of the grip cover and the metallic grip of the bat therebeneath;



placing a pin or cotter in said hole thus penetrating the grip end and the grip; and

physically deforming the pin or the cotter by deforming the pin at the center thereof between the inside wall portions of the grip, the portion of the pin between the inside wall portions of the grip thus being bent to prevent removal of the pin through said hole, and further deforming the pin, to further prevent removal thereof, by calking the pin to the inside wall of the grip.

---

**4,213,608**

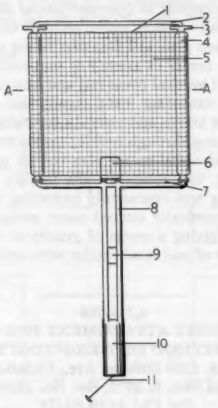
**GAME RACQUETS**

**Mithra S. Krishnan, 1041 Township Line Rd., Jenkintown, Pa. 19046**

**Filed Sep. 15, 1978, Ser. No. 942,949**

**Int. Cl.[3] A63B** *19/02*

**U.S. Cl. 273—73 C** **7 Claims**



1. A game racquet-containing in combination:

a substantially rigid frame in the form of a handle and a head;

two rotatable spools mounted on members by means of bearings on opposite sides of said head, said spools having approximately parallel axes of rotation;

a ball-contacting facing containing closed loops of strings held in tension around the aforementioned spools;

wherein forces applied to said facing between said spools in a non-perpendicular direction with respect to said facing, or torques applied directly to said spools to cause them to rotate will provide movement of said facing around said members thus imparting a spin to a ball that contacts said facing during said rotation.

**4,213,609**

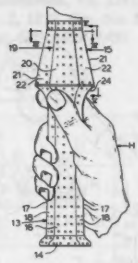
**GRIP BUMPER**

**Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025**

**Filed Apr. 18, 1979, Ser. No. 31,189**

**Int. Cl.[2] A63B** *5/20*

**U.S. Cl. 273—75** **7 Claims**



1. A grip bumper for the handles of striking devices which comprises a grip sized for fitting around the handle of such a device having a continuous outturned peripheral rib converging continuously without any protuberance to the grip for receiving thereagainst portions of the hand of the user without restraining against rotation of the device in the hand to deliver additional striking thrust from the hand to the device.

---

**4,213,610**

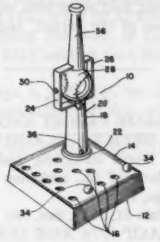
**TOY BASEBALL GAME**

**Jacinto Velazquez, 1257 Loring Ave., Brooklyn, N.Y. 11208**

**Filed Apr. 20, 1978, Ser. No. 898,039**

**Int. Cl.[2] A63F** *7/02, 7/06*

**U.S. Cl. 273—93 R** **1 Claim**

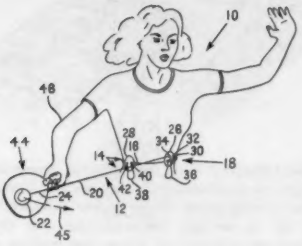


1. In a toy baseball game, an open base including a plurality of pockets recessed from the upper surface of the base, a batting device comprising an upright hollow post fixed on said base to extend above said base and having an opening in the lower part thereof; said post having an aperture adjacent its upper end; a ball ejecting mechanism communicating with said aperture mounted to said post, a bracket secured to said upper end; a simulated hollow baseball rotatably mounted on said bracket and containing a plurality of smaller, simulated baseballs bearing indicia referring to baseball game occurrences; said hollow baseball having an opening of a size sufficient to allow successive passage of said smaller baseballs therethrough; said opening being rotatable to a first position above said ball ejecting mechanism for delivering, by gravity, one ball at a time to said base for reception in one of said pockets, and said baseball being rotatable to a second position in which said opening is above the interior of the baseball and free from the ball ejecting mechanism so that individual smaller baseballs may be freely inserted into said interior.

## 4,213,611
## BODY TETHERED BALL GAME

D. Michelle Hicks, 1581 Sunnydale Ave., San Francisco, Calif. 94134

Filed May 2, 1978, Ser. No. 902,241
Int. Cl.[2] A63B 67/00
U.S. Cl. 273—414 3 Claims



1. A ball game, which comprises:

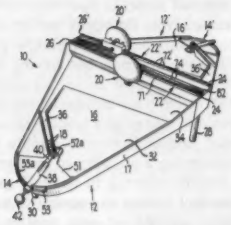
a resilient ball, and

an adjustable support be worn about a human torso, said adjustable support comprising a cord and a member having three apertures extending therethrough dimensioned to receive the cord in a friction fit, the cord passing through a first one of said apertures in a first direction, forming a loop and passing through a second one of the apertures in the opposite direction, forming a second loop to fit around the torso of a wearer, then passing through the third aperture in the first direction, the remainder of the cord after passing through the third aperture constituting a flexible tether attached at its end remote from said apertured member to said resilient ball, the length of said flexible tether being adjustable to a suitable length for allowing said resilient ball to be hit in a forward stroke by a person wearing said adjustable support, pass partially around the torso of the person, and be hit in a reverse stroke.

## 4,213,612
## SHIFTABLE GAME TARGET AND PROJECTILE LAUNCHING DEVICE FOR ACTUATING SAME

John R. Wildman, North Riverside, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 31, 1978, Ser. No. 892,169
Int. Cl.[3] A63F 9/14; A63B 63/00, 65/12
U.S. Cl. 273—355 16 Claims



1. A target game apparatus comprising:

a playing surface including at least one player station defined thereon;

at least one projectile;

at least one target device;

means defined at said player station for launching a projectile and means for returning said projectile to said launching means;

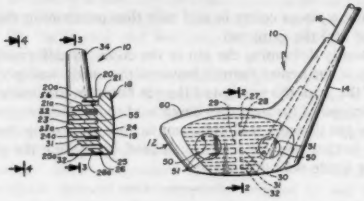
support means for mounting said target device for movement transversely with respect to the player station; and

target drive means including a rack on the playing surface and a gear rotatably mounted on the support means and engaging said rack for movement of the target a predetermined distance along said playing surface upon actuation thereof by control of a projectile.

## 4,213,613
## GOLF CLUB HEAD WITH CENTER OF GRAVITY NEAR ITS STRIKING FACE

Gordon W. Nygren, 321 Spring Valley Dr., Bloomington, Minn. 55420

Filed Dec. 29, 1977, Ser. No. 865,702
Int. Cl.[2] A63B 53/04
U.S. Cl. 273—169 12 Claims



1. A golf club comprising a shaft, a metal face plate, the center line of said shaft residing in a first vertical plane disposed rearwardly from said face plate and generally parallel to said face plate, metal means extending rearwardly from the back side of said face plate and terminating at a location adjacent said vertical plane, the mass of said rearwardly extending metal means decreasing in opposite lateral directions from a centrally disposed vertical plane passing through said first plane and said face plate and also decreasing toward said face plate so that the center of gravity of said metal means resides between said first vertical plane and said face plate, the mass of said rearwardly extending metal means also decreasing in a vertical direction above and below a centrally disposed horizontal plane passing through said face plate so that the center of gravity of said metal means also resides generally in said horizontal plane, and relatively low density foamed plastic material encasing said rearwardly extending metal means to form an aerodynamically curved outer surface, said foamed plastic material having a center of gravity so that the overall center of gravity of said head resides substantially in said first vertical plane.

## 4,213,614
## PRACTICE WEIGHT ATTACHMENT FOR GOLF CLUBS AND METHOD OF WEIGHTING SAME

George J. Philippi, 1209 Stillman Ave., Plainfield, N.J. 07060

Filed Mar. 8, 1979, Ser. No. 18,857
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—194 B 14 Claims

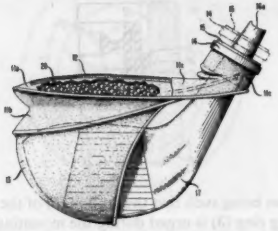
1. A practice weight attachment for golf clubs having a wooden driving head supported on a shaft affixed to said head by a neck tapered from a thinner section adjacent the upper portion of said shaft to a thicker section adjacent said head, said attachment comprising in combination:

a collar having a tapered central axial bore substantially the same dimension as the thicker section of said tapered neck adjacent said wooden head, said central bore having a tapered longitudinal slot having substantially the same taper but slightly smaller in width than said central axial bore, whereby said collar is constructed to be slipped onto said thinner section of said tapered neck and to slip down to engage substantially more than half of the circumfer-

ence of said neck in the thicker section thereof, whereby said collar is held in positive engagement with said neck until removed by sliding said collar up the tapered neck adjacent said head to a point where said neck is smaller than the width of said tapered slot where it can be readily removed;

a cover of flexible fabric for said wooden driving head;

means for holding said cover fixed to and depending at one of its ends from said collar;



said cover horizontally compartmented by a partition substantially parallel to its major plane forming an upper pocket for accommodating weighted material, including means for opening said upper pocket to receive said weighted material and means for completely closing said upper pocket to enclose said weighted material; and

a lower pocket secured to the underside of said upper pocket, said lower pocket having a rearwardly directed opening constructed and arranged to accommodate a wooden golf club head.

---

**4,213,615**

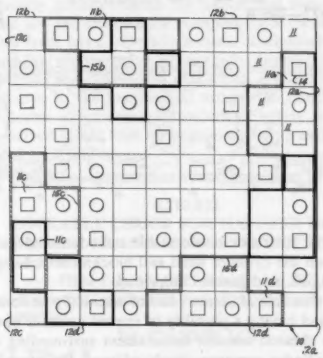
## BOARD GAME WITH MOVABLE PLAYING PIECES

**Howard C. Price, 7 Crump St., Huntington, W. Va. 25705**

**Filed Jul. 24, 1978, Ser. No. 927,608**

**Int. Cl.[2] A63F *3/02***

**U.S. Cl. 273—260** **5 Claims**



**1.** A game apparatus comprising:

a playing surface divided into a plurality of spaces;

a plurality of types of symbols marking said spaces wherein each said space has a symbol of one type associated therewith; and

a plurality of playing pieces for each player for movement on the playing surface from one space to another wherein each playing piece has at least three sides, each side being marked with one type of symbol to match with the same type of symbol in the spaces on the board, such that each piece has at least three types of said symbols thereon whereby the playing pieces may be twisted and rotated about vertical and horizontal axis in order to effect playing of the game.

---

**4,213,616**

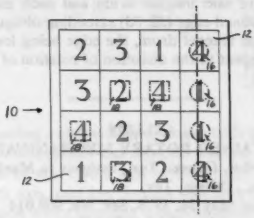
## FOUR-IN-A-ROW BOARD GAME

**Thomas E. Dickey, Stanardsville, Va. 22973**

**Filed Jul. 2, 1979, Ser. No. 53,806**

**Int. Cl.[3] A63F *3/00***

**U.S. Cl. 273—271** **10 Claims**




**1.** A board game comprising (1) a gameboard, said board being divided into sixteen units only to provide four vertical and four transverse rows, each of said sixteen units having indicia thereon, the indicia on said sixteen units comprising four individual sets of indicia and the units in at least each of said vertical or each of said transverse rows including each of said four sets of indicia of four each; (2) sixteen cards having indicia thereon in toto corresponding to the indicia on said sixteen units of said gameboard; and (3) sixteen markers in at least two sets for placing on and distinguishing selected units of said sixteen units of said gameboard.

---

**4,213,617**

## ASSEMBLY FOR SEALING LEAD-IN AREAS IN A DEVELOPER STATION

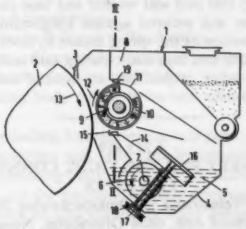
**Werner Salger, Hamburg, Fed. Rep. of Germany, assignor to Lumoprint Zindler KG (GmbH & Co.), Hamburg, Fed. Rep. of Germany**

**Filed Apr. 6, 1979, Ser. No. 27,775**

**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816621**

**Int. Cl.[2] F16J *15/40, 15/54***

**U.S. Cl. 277—12** **10 Claims**



**1.** A sealing assembly for sealing lead-in areas into a developer station of a copying machine in which a latent image that has been established in a conductive material by an at least partly magnetizable mixture of a developed powder is developed whereby the developer station comprises: a developer housing enclosing the developer station and including a pair of laterally spaced side walls (22,23), a magnet drum (9) extending between and journalled in side walls (22,23); drive means (26) for the magnet drum; a magnet system (10) provided in and

extending in the axial direction of said magnet drum; a supply space (5) within said developer housing and spaced from said magnet drum for holding a mixture of developer powder; means (16) located within said supply space for feeding the mixture of developer powder from the supply space to along the length of the magnet drum; wherein the improvement comprising that support means (15, 19) are located within said developer housing exteriorly of and at the opposite ends of said magnet drum, outer magnet assemblies (28–31, 36, 37 50) mounted on said support means and positioned adjacent to the opposite ends of said magnet drum, said outer magnet assemblies comprising magnet pieces (28–31, 36, 37) located on opposite sides of said magnet drum and each magnet piece including an inclined edge (32, 33) extending obliquely relative to the axis of the magnet drum, the edge being located at the outside with respect to the direction of rotation of the magnet drum (9),.

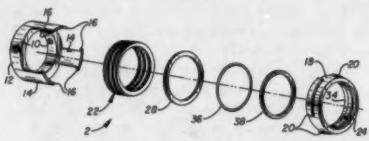
---

**4,213,618**

## SELF-CONTAINED ROTARY MECHANICAL SEALS

**Mickey D. Thurber, Odessa, Tex., assignor to Mechanical Seal & Service, Inc., Odessa, Tex.**

**Filed May 24, 1978, Ser. No. 909,014**
**Int. Cl.² F16J 15/34**
**U.S. Cl. 277—93 R** **10 Claims**



1. In a rotary mechanical seal of the type having an annular base adapted for mounting on a rotating shaft, a seal washer, and a spring means located between the base and the seal washer for urging said seal washer against a housing through which the shaft extends to form a seal, the improvement comprising:

a plurality of longitudinal lugs extending from said annular base in circumferentially and radially spaced-apart relationship with said shaft such that said spring means and seal washer can be received between said lugs and shaft;

circumferential projections extending away from said lugs on the ends of said lugs opposite said base; and

a plurality of circumferential projections extending radially outward from said seal washer in circumferential spaced-apart relationship sufficient for receiving said lugs therebetween so that said seal washer and base can be engaged for rotation and secured against longitudinal separation under the action of the spring means by inserting said seal washer under said lugs and twisting said seal washer until the seal washer projections are locked behind the lug projections.

---

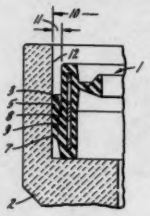
**4,213,619**

## SEALING INSERT FOR THE TIGHT CONNECTION OF TWO PIPES

**Christian Arlt, Weinstrasse 14, Dinkelackerring 38, 6730 Neustadt, and Gerhard Arlt, 6836 Oftersheim, Neustadt, both of Fed. Rep. of Germany**

**Filed Jun. 14, 1978, Ser. No. 915,402**
**Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726959**
**Int. Cl.² F16J 15/02**
**U.S. Cl. 277—207 A** **2 Claims**

1. A sealing insert for pipes having a contact support (9) provided at its exterior side with at least one elastic sealing ring having a section (5) of pedetermined cross-sectional thickness, said section of said ring being connected via a bridge (7) thinner in cross section to the contact support, and in its mounted position the ring being supported by said contact support of the sealing insert, characterized by the fact that the section (5) of the radially exterior sealing ring (3) is spaced in the premounting position axially from a radial reduction of the outer diameter (8) of the radially and inwardly located contact support (9) or from the outer axial end of said contact support, and the



dimensions being such that the section (5) of the radially external sealing ring (3) is urged during the mounting of the sealing insert (1) either with radially narrow (FIG. 2) or most narrow (FIG. 3) sealing surface distances under axial expansion of the bridge (7) into said radial reduction of the outer diameter (8) or beyond the axially outer end of said contact support (9).

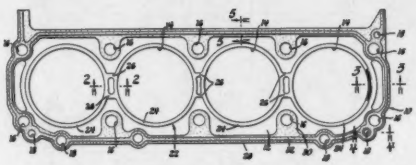
---

**4,213,620**

## CYLINDER HEAD GASKET

**Lawrence C. Kennedy, Birmingham, and Joseph Kowalis, Plymouth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 20, 1978, Ser. No. 971,361**
**Int. Cl.² F16J 15/06, 15/12**
**U.S. Cl. 277—235 B** **5 Claims**



1. A close tolerance conformable cylinder head gasket for use between the cylinder head and block of an internal combustion engine, said gasket comprising

a single sheet metal carrier plate of essentially uniform thickness and having a plurality of spaced cylinder openings,

a partly sheared annular embossment surrounding each of said cylinder openings closely adjacent the edges thereof, said embossments comprising annular portions of the carrier plate material partly displaced by shearing from the plane of the adjacent body of the plate,

said cylinder openings having a metallic cover wrap enclosing their edges and both faces of the adjacent embossments, said wrap comprising interconnected rings formed from a single metal sheet of essentially uniform thickness,

said wrap cooperating with said opening-defining plate edges and their adjacent embossments to provide close tolerance conformable metallic sealing means for each of the cylinder openings.

4,213,621

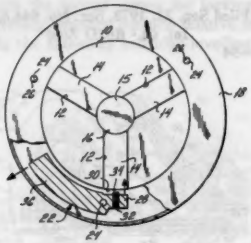
## CENTRIFUGALLY-ACTUATED CHUCK ATTACHMENT

Anton Fink, and Nicholas A. Fink, both of 149 Crescent Dr., Albertson, N.Y. 11507

Filed Aug. 23, 1978, Ser. No. 935,924

Int. Cl.³ B23B 31/14

U.S. Cl. 279—1 C 4 Claims



1. A centrifugally-actuated chuck attachment for a chuck having a rotatable chuck body and a plurality of jaws supported in said chuck body and radially movable therein relative to the longitudinal axis of the chuck body between a retracted and clamping position, comprising:

a hollow annular shaped housing mountable about the chuck body, defining an annular U-shaped channel, the opening of which faces the chuck body and the jaws thereof; and

a lever associated with each of the jaws pivotably mounted on a pin in said channel in said housing for pivotal movement about a pivot axis parallel to the longitudinal axis of the chuck body, said lever having a first and second pivot arm disposed on opposing sides of said pivot axis thereof, said first arm being disposed for operative engagement with its associated jaw and said second arm having an effective length and weight such that it moves outwardly from the longitudinal axis of the chuck body as a result of the centrifugal force developed upon rotational movement of the chuck body and, in turn, urges said first arm into engagement with said jaw associated therewith to thereby counterbalance the centrifugal force acting on said jaw and enhance the clamping force thereof; wherein said lever has a generally arcuate configuration, wherein said first pivot arm has an internally-threaded bore formed therethrough having an axis which is disposed normally relative to the longitudinal axis of the chuck body and wherein an externally-threaded set screw is threadably received in said bore for engagement with said jaw associated with said lever.

---

4,213,622

## LOCKABLE CHUCK FOR HAMMER DRILL

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Feb. 13, 1979, Ser. No. 11,773

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806796

Int. Cl.² B23B 5/22

U.S. Cl. 279—1 K 8 Claims

1. A chuck assembly comprising:

a chuck body lying on a chuck axis and formed with a radially extending guide;

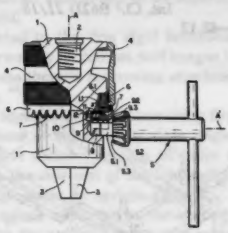
a plurality of jaws on said body radially displaceable;

a sleeve rotatable on said chuck body about said axis and having a toothed rim adjacent said guide;

means in said body for radially displacing said jaws on rotation of said sleeve about said axis;

a bolt slidable radially of said chuck axis in said guide and having a portion displaceable between a locking position engaged between the teeth of said rim and preventing said sleeve from rotating relative to said body about said chuck axis and a retracted position spaced inwardly of said teeth and allowing such rotation;

biasing means for urging said bolt into said locking position; and



a key having a pinion radially engageable between said teeth and with said bolt and rotatable about a key axis generally radial of said chuck axis to rotate said sleeve about said chuck axis, said key forcing said bolt into said retracted position when engaged with said teeth.

---

4,213,623

## NONLOOSENING DRILL CHUCK

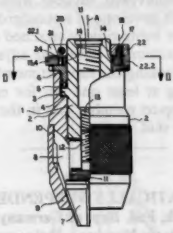
Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Feb. 13, 1979, Ser. No. 11,774

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 7804747[U]

Int. Cl.² B23B 31/14

U.S. Cl. 279—1 C 10 Claims



1. A chuck comprising:

a chuck body defining a chuck axis;

a plurality of generally angularly equispaced and radially displaceable jaws on said body;

a tightening body rotatable on said chuck body about said axis;

means including formations on said jaws on on said bodies for displacing said jaws radially inwardly on rotation of said tightening body on said chuck body in one rotational sense and for permitting radial outward displacement of said jaws on rotation in the other opposite sense;

an axially centered array of ratchet teeth on one of said bodies;

a ratchet on the other of said bodies radially engageable with said ratchet teeth, said ratchet teeth and ratchet being so constructed as to permit rotation of said tightening body on said chuck body in said one sense when engaged and to prevent rotation in the opposite sense when engaged; and

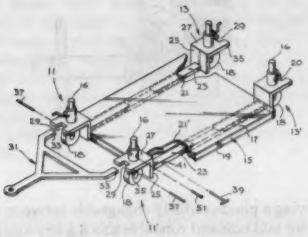
means including a radially displaceable counterweight connected to said ratchet for urging same into engagement with said ratchet teeth on rotation of said bodies about said axis.

4,213,624

## PALLET TRANSPORT SYSTEM

Ralph K. Sanders, Placentia, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Sep. 5, 1978, Ser. No. 939,626
Int. Cl.[2] B62D 21/18
U.S. Cl. 280—43.12 14 Claims



1. An adaptable wheel dolly attachable with a plurality of like wheel dollies to a shipping skid for lifting and transporting said skid comprising:

a frame;

a wheel and axle;

a strut member coupled to the axle and pivotably mounting the wheel to a first portion of the frame positioned over the wheel;

means coupled to the strut member and the frame for elevating the frame relative to the strut member and wheel between a lowered position suitable for engaging a shipping skid and a selected elevated position for lifting said skid;

a second portion of the frame angled downwardly from the first portion and extending to a level adjacent the bottom

an elongated cantilevered support member shaped to fit within a fork lift envelope of a standard shipping skid, the support member being rigidly attached at its proximal end to the second portion of the frame adjacent its lower end and means for locking the support member to the shipping skid comprising at least one pin for engaging matching holes in the support member and in the fork lift envelope of the shipping skid.

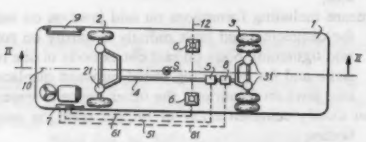
---

4,213,625

## PNEUMATICALLY SUSPENDED BUS

Hans Hagen, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,183
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739637
Int. Cl.[2] B62D 21/18
U.S. Cl. 280—43.23 6 Claims



1. A pneumatically suspended bus, the body of which is supported on front and rear axles by means of air bellows, wherein: an entrance means is arranged in the front portion of the bus; support strut means for said body are provided on the body behind and next to its center of gravity for lifting said bus body relative to a roadway being transversed by said bus, said air bellows are associated with the respective front and rear axles to support said body and are connected to one another by means of a connecting line for establishing communication therebetween when said support strut means are extended to lift said bus body.

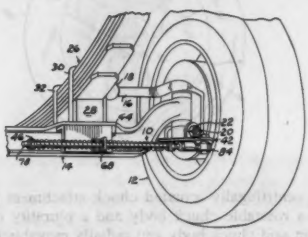
---

4,213,626

## STEERING STABILIZER APPARATUS

George B. Moore, 16651 Island Cir., Huntington Beach, Calif. 92649

Filed Sep. 22, 1978, Ser. No. 944,832
Int. Cl.[2] B62D 7/06
U.S. Cl. 280—94 3 Claims



1. In a vehicle having a single piece front axle journalling a steerable wheel assembly for horizontal turning movement about a generally vertical axis by a steering control arm connected with the wheel assembly including a pitman arm horizontally intersecting the turning axis and movable about the turning axis in unison with turning movement of the steerable wheel assembly and having a leaf spring assembly overlying the axle and secured thereto by a spring clamp bolt, the improvement comprising:

pitman bracket means rigidly secured to said pitman arm and having an apertured end portion projecting forwardly of said turning axis,

said pitman bracket means comprising an elongated plate longitudinally underlying said pitman arm,

an apertured ear transversely secured to said plate intermediate its ends in upstanding relation for surrounding one end portion of said pitman arm, and,

a clamp connecting the other end portion of said pitman arm to said plate;

fixed bracket means including an apertured prong supported by said spring clamp bolt forwardly of said axle;

spring assembly means including a shaft supported intermediate its ends by said apertured prong for longitudinal reciprocating movement relative thereto,

said spring assembly means including a pair of compression springs respectively surrounding opposing end portions of said shaft on opposing sides of said apertured prong, and,

spring retaining means on the respective end portion of said shaft for adjusting the compression of said springs; and,

universal joint means connecting one end portion of said shaft with the apertured end portion of said pitman arm bracket means.

---

4,213,627

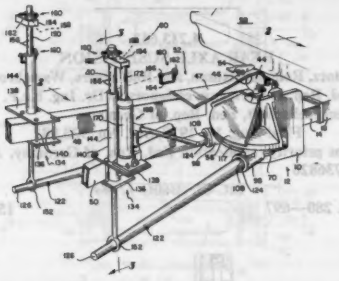
## TRAILER HITCH

Woodrow F. Thompson, 440 Pine Villa Dr., City of Atlantis, Lantana, Fla. 33462

Filed Nov. 6, 1978, Ser. No. 957,902
Int. Cl.[2] B62D 53/00
U.S. Cl. 280—406 A 6 Claims

1. A trailer hitch assembly comprising towing means secured to a towing vehicle, connecting means secured to said towing means and adapted for detachably engaging the tongue of a trailer, the trailer tongue including forwardly converging side rails, said connecting means including vertical post means, load-levelling bar means, means for pivotally mounting said

load-levelling bar means on said connecting means for swinging movement in a generally horizontal plane about said post means, support means mounted on said trailer tongue, the support means including first means longitudinally movably engaging the side rails of the trailer tongue, second means movably engaging the ends of the bars remote from the housing members and third means for vertically selectively adjusting the second means relative to the first, and fourth means cooperating with the second means for locking the second means in a vertically adjusted position relative to the first, to vary selectively the anti-sway and load-levelling characteris-



tics of the coupling between the trailer and the towing vehicle, and cam means disposed between said load-levelling bar means and connecting means for varying the forces transmitted through said load-levelling bar means upon said swinging movement of said load-levelling bar means about said post means, said load-levelling bar means comprising two housing members disposed adjacent each other and extending rearwardly from said post means, each of said housing members including a rearwardly opening socket, said load-levelling bar means comprising a pair of generally circular cross-section bars and each said socket having a generally circular cross-section to permit rotation of said bars in said sockets.

---

**4,213,628**

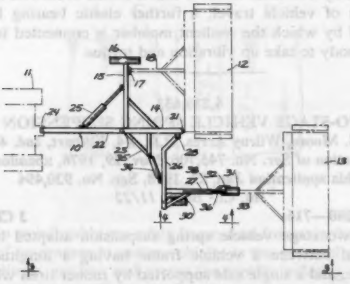
## PULLING HITCH FOR AGRICULTURAL IMPLEMENTS

**Robert D. Hardesty, Spangle, Wash., assignor to Tom Pottratz; Ronald Pottratz, Jr. and Advanced Design and Construction, all of Latah, Wash.**

**Continuation of Ser. No. 853,486, Nov. 21, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,429**

**Int. Cl.[2] B60D *1/18***

**U.S. Cl. 280—412** **12 Claims**



1. A pulling hitch for connecting a plurality of transverse agricultural implements to a single towing vehicle, comprising:

a first rigid horizontal frame comprising a longitudinal member having spaced front and rear ends, and a transverse member fixed to the front end of said longitudinal member and extending to one side thereof;

first hitch means mounted to the transverse member for attachment to the pulling tongue of a first transverse agricultural implement located behind the first frame;

bracket means mounted at the rear end of said longitudinal member for direct attachment to an adjacent side of said first implement;

a tongue mounted to the first rigid horizontal frame and extending forwardly therefrom, said tongue having a front end with means thereon for towing attachment to a powered vehicle;

a second rigid horizontal frame comprising first and second members joined at substantially right angles to one another, said first member having an outer end pivotally connected to the rear end of the longitudinal member of said first frame about an upright axis;

second hitch means mounted to the second member for attachment to the pulling tongue of a second transverse agricultural implement located behind the second frame;

and means operably connected between said first and second frames for alternately locating the second frame about said second upright axis relative to said first frame between a first angular position in which the second member is laterally offset and substantially parallel to the longitudinal member of said first frame, and a second angular position in which said second hitch means is spaced rearward from said first hitch means and in longitudinal alignment therewith.

---

**4,213,629**

## BRAKE FOR SKIS

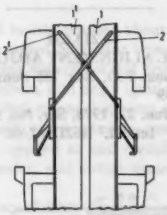
**Erwin Krob, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Switzerland**

**Filed Mar. 27, 1978, Ser. No. 890,790**

**Claims priority, application Austria, Apr. 4, 1977, 2320/77**

**Int. Cl.[2] A63C *11/02***

**U.S. Cl. 280—605** **8 Claims**



1. A device for securing the skis of a pair together, each of said skis having a pair of longitudinal edges, comprising:

a ski brake mounted on the upper surface of each of said skis, each of said ski brakes having a braking arm projecting in the braking position thereof beneath the bottom surface of said ski and along a longitudinal edge of said ski and at an acute angle to a plane defined by the upper surface of said ski; and

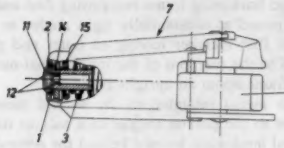
elastically deformable means on said braking arm projecting from a first surface thereof, said first surface on a first braking arm associated with a first ski engaging a second surface on a second braking arm associated with a second ski when said first and second skis are positioned bottom-to-bottom, said first and second braking arms thereby defining a cross, said elastically deformable means on said first braking arm being in an undeformed condition thereof on a side of said second braking arm remote from said first ski to thereby hold said skis together in said bottom-to-bottom position.

4,213,630

## SPRING LOCKING DEVICE

Josef Svoboda, Schwechat; Herbert Wuerthner, Hainburg, and Karl Stritzl, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Apr. 26, 1978, Ser. No. 900,302
Claims priority, application Austria, Apr. 27, 1977, 2929/77
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—634 2 Claims



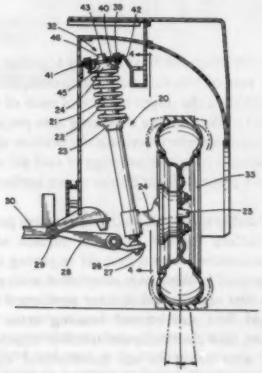
1. The combination of a release ski binding having a housing and an adjustable spring abutment thereon for changing the effective force of a spring in said ski binding housing, said adjustable spring abutment being initially exposed through an opening in said ski binding housing, and a seal member of brittle material for indicating that an adjustment of said adjustable spring abutment has taken place subsequent to an authorized adjustment thereof, said seal member being received in said opening in said ski binding housing directly in the pathway to said adjustable spring abutment, first means defining a slot on said adjustable spring abutment, second means defining a forced fit connection of said seal member in said slot for securely holding said seal member in said pathway to prevent ready access to said adjustable spring abutment, said seal member having at least two extensions thereon and at least one outwardly facing readily visible preset breaking point located adjacent said forced fit connection and said extension means, said forced fit connection of said seal member in said slot being of sufficient strength such that said seal member cannot be removed without destruction occurring at said readily visible preset breaking point.

4,213,631

## VEHICLE WHEEL ALIGNMENT ADJUSTMENT DEVICE

Edward D. Wilkerson, P.O. Box 755 South Court, Normandy Beach, N.J. 08739

Filed Jun. 22, 1978, Ser. No. 918,199
Int. Cl.[2] B62D 17/00
U.S. Cl. 280—661 8 Claims



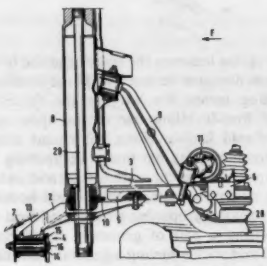
1. An adjustment assembly for varying the attitude of a wheel spindle about the steering axis of a vehicle wherein the spindle is supported on a lower control member with a compressible strut of the MacPherson type between the lower control member and the upper control member, comprising; an opening in the upper control member of sufficient size to permit lateral adjustment of the strut, a plurality of removable fastener means carried by the upper control member, and plate means secured by said fastener means to said upper control member engaging said strut to determine the angular position of the strut and the attitude of the wheel spindle, said plate means being flat and having a circular opening for engaging and laterally supporting the upper end of the MacPherson strut.

4,213,632

## REAR AXLE SUSPENSION

Erich Stotz, Rommelshausen, and Rolf Sivers, Warmbronn, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 933,982
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736826
Int. Cl.[2] B60G 11/44
U.S. Cl. 280—697 15 Claims



1. In a rear axle suspension for vehicles, especially automotive vehicles, with independently spring-suspended wheels that are braced against a bolster by torsion spring elements, whereby the bolster is elastically connected with the vehicle frame or body, the improvement wherein the bolster comprises forward and rear supports which run in the longitudinal direction of the vehicle, whereof the forward support, as seen in the direction of travel, is made as a rigid part, elastic bearings being provided by which the resilient member is braced on the vehicle body and insulated from vibration, and the rear support is formed by a resilient member that is elastic crosswise to the direction of vehicle travel, a further elastic bearing being provided by which the resilient member is connected to the vehicle body to take up vibration and torque.

4,213,633

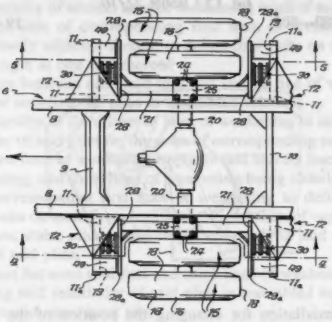
## TWO-STAGE VEHICLE SPRING SUSPENSION

Robert G. Moore, Wilroy Acres, R.D. #4, Elkhart, Ind. 46514

Continuation of Ser. No. 745,706, Nov. 29, 1976, abandoned.
This application Jun. 29, 1978, Ser. No. 920,494
Int. Cl.[2] B60G 11/22
U.S. Cl. 280—716 3 Claims

1. A two stage vehicle spring suspension adapted to be interposed between a vehicle frame having a longitudinal centerline, and a single axle supported by rubber tired wheels at its opposite ends, and comprising a torsionally rigid axle beam generally parallel with said centerline and fixed at its center to each axle end along the side of its tire toward said centerline and its ends being arranged adjacent the tread of its tire, a frame bracket secured to said frame to project outwardly to be in alinement with each end of each beam and the tread of each tire, and an axle bracket fixed to each beam end and

interposed between the companion tire tread and each frame bracket; wherein the invention comprises a vertically acting rectilinear movement first stage shear rubber spring interposed between and fixed to each pair of said frame and axle brackets a first distance from said centerline, a vertically acting second stage compression spring of predetermined effective height alongside each shear rubber spring and fixed to one of each pair of said brackets, said predetermined effective height being such as to cause said compression springs to come into operative relation with the other of each pair of said brackets when



a predetermined load is imposed on said frame, and said compression springs being arranged a second distance from said centerline, said second distance being greater than said first distance and all of said springs being arranged generally in the same horizontal plane whereby said compression springs are outboard from said shear springs to provide wider effective spring centers for said frame under heavy load conditions and thereby reduce sidesway and the danger of roll over of the frame when loaded but to be substantially ineffective when the frame is empty and thereby provide a soften empty body ride.

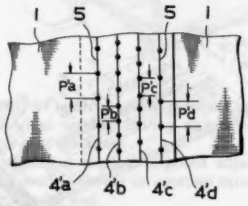
---

**4,213,634**

## CONSTRUCTION OF STITCHING PORTIONS OF GAS BAGS

**Tadayoshi Hoshino, Okazakishi, and Yoichi Sudo, Toyotashi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Feb. 5, 1979, Ser. No. 9,680**
**Claims priority, application Japan, Feb. 6, 1978, 53/012644**
**Int. Cl.[2] B60R *21/08***
**U.S. Cl. 280—728** **8 Claims**




1. In an inflatable gas safety bag system for use in the protection of passengers in motor vehicles in the event of collision, including a gas bag and means for rapidly inflating said bag with a gas upon collision, the improvement comprising the gas bag being formed of overlapping fabric pieces sewn together along stitch margins with a plurality of laterally spaced rows of stitches, the improvement comprising means to substantially uniformly distribute tensile load, on inflation of said bag, among said spaced rows of stitches, said means comprising at least three said rows of stitches wherein the middle of said rows of stitches has a relatively fine stitch pitch and the outer of said rows of stitches have relatively coarse stitch pitches.

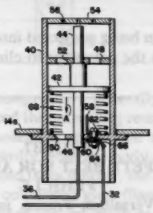
---

**4,213,635**

## TWO-STAGE AIR BAG SYSTEM

**Nobuyuki Inokuchi, Toyota, and Kouzo Hamada, Okazaki, both of Japan, assignors to Toyota Kodosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Continuation of Ser. No. 807,328, Jun. 16, 1977, abandoned.**
**This application Nov. 13, 1978, Ser. No. 960,005**
**Int. Cl.[2] B60R *21/08***
**U.S. Cl. 280—737** **2 Claims**



1. A two-stage air bag system for a vehicle comprising:
a housing having one open end, said housing further being divided into two chambers which are adjacent to each other;
a first pressure device comprising a solid gas producing material provided in one of the two chambers;
a second pressure device comprising a solid gas producing material provided in another one of the two chambers;
a first ignition means for igniting said solid material at the first pressure device, said means causing ignition when an emergency condition occurs;
a filter means provided on said housing enclosing said open ends;
an air bag coupled to said housing about said open ends;
a delayed ignition signal generator being provided in said solid gas producing material of said first pressure device in one of said chambers, said delay ignition signal generator comprising a switch means that turns on when a pressure generated by said gas producing material of said first pressure device applied to said switch means exceeds a predetermined value, said switch means comprising:
a case,
a movable contact slidably disposed in said case,
a fixed contact provided in said case, and
a spring means for biasing said movable contact away from said fixed contact; and
a second ignition means responsive to said delayed ignition signal generator for igniting said solid material of said second pressure device.

---

**4,213,636**

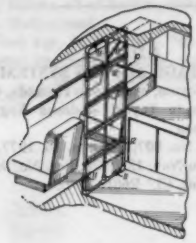
## SAFETY BARRIER FOR A VEHICLE

**William B. King, 5024 Buchanan St., Hollywood, Fla. 33021**

**Filed Sep. 18, 1978, Ser. No. 943,459**
**Int. Cl.[2] B60R *21/10***
**U.S. Cl. 280—749** **5 Claims**

1. A safety barrier for preventing passengers from being projected to a forward compartment in vehicle from an aisle thereof, said barrier comprising a frame element of appropriate shape and dimension to extend from the ceiling to the floor and across the width of the aisle in the vehicle and a plurality of

horizontally extending endless elastic bands extending across the frame and being spaced vertically apart to prevent a standing passenger from being projected into the forward compartment but to allow the passenger to climb therethrough.



---

**4,213,637**

## PASSIVE SAFETY BELT FOR AN AUTOMOBILE VEHICLE

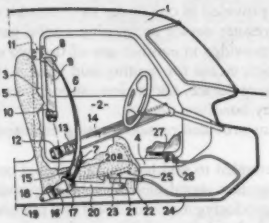
**Gerard Mauron, Versailles, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France**

**Filed Dec. 5, 1978, Ser. No. 966,569**

**Claims priority, application France, Dec. 15, 1977, 77 37892**

**Int. Cl.³ B60R *21/10***

**U.S. Cl. 280—802** **11 Claims**



1. A safety device in combination with a seat and a vehicle body having a pivotal door for retaining an occupant of the vehicle on the seat, the device comprising a belt, a support rigid with the vehicle body, an arm, a pivotal connection connecting the arm to the support,

the pivotal connection being located on a side of the seat opposed to the door of the vehicle and adjacent a front end of the seat, a belt holding member carried by the arm adjacent a free end of the arm and carrying a portion of said belt, a transmission connecting the arm to the door and comprising a lever pivotally mounted on a lateral part of the vehicle body adjacent the door, means operatively connecting the lever to the door to pivot the lever as the door is opened, and a cable connecting the arm to the lever, the arm being pivotal between an upper position

in which a line through the pivotal connection and the belt holding member is substantially vertical and a lower position in which the belt holding member is lowermost for retaining the occupant of the seat, the lower position corresponding to the closed position of the door, the transmission being arranged to ensure that the angular velocity of displacement of the arm for a given velocity of the pivotal movement of the door is higher in a first half of its movement than in a last half of its movement from said lower position to said upper position.

---

**4,213,638**

## INSTALLATION FOR CHANGING THE POSITION OF AN UPPER FASTENING OR DEFLECTION POINT OF A SAFETY BELT

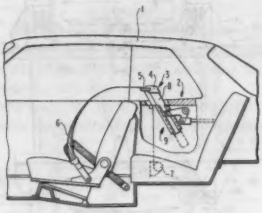
**Bruno Sacco; Walter Dalheimer, both of Sindelfingen, and Friedrich Schwarz, Deckenpfronn, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Aug. 22, 1978, Ser. No. 935,961**

**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738140**

**Int. Cl.² B60R *21/10***

**U.S. Cl. 280—808** **19 Claims**



1. An installation for changing the position of the upper fastening or deflection point of a safety belt, including a deflection fitting means and means for bearing said deflection fitting means and for changing the position of said deflection fitting means from a lower rest position to a raised use position at least during the period while the safety belt is being used, said deflection fitting means being provided at the upper end of the bearing and position-changing means, and, the bearing and position-changing means being covered off by an inner side wall covering means while in said lower rest position and projecting beyond the side wall covering means while in said raised use position at least during the period while the safety belt is being used.

---

**4,213,639**

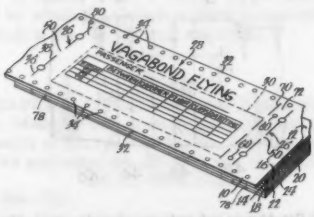
## CONTINUOUS BUSINESS FORM ASSEMBLY

**Howard Absler, Skokie; Joseph Juszak, and Thomas Gore, both of Crystal Lake, all of Ill., assignors to Uarco Incorporated, Barrington, Ill.**

**Filed Sep. 11, 1978, Ser. No. 941,006**

**Int. Cl.² B41L *1/26***

**U.S. Cl. 282—11.5 A** **1 Claim**




1. A continuous business forms assembly comprising:

a plurality of superimposed plies of paper each having a face and a back, the face of each ply being uppermost, there being an uppermost ply, a lowermost ply and a plurality of intermediate plies;

the uppermost ply in said assembly being wider than the remainder of said plies and having punched margins displaced from the corresponding margins of the remainder

of said plies to provide feeding means for feeding the assembly thru a printing device;

a plurality of first lines of weakening extending across said plies at regular intervals to define a plurality of individual form lengths of said assembly, each said first line of weakening being defined by a plurality of aligned, but separate, slits extending across all of said plies and through the same between the margins of said remainder of said plies but not in the margins of said uppermost ply, and holes in the intermediate plies of said assembly interconnecting the ends of adjacent ones of said slits;

a plurality of second lines of weakening in all of said plies on one side of corresponding first lines of weakening and closely adjacent thereto to define first stubs on each form length at one end thereof;

means between each said first and second line of weakening for securing the plies in assembled relation;

a plurality of third lines of lines of weakening in said remainder of said plies on the sides of corresponding ones of said first lines of weakening opposite said second lines of weakening, said third lines of weakening being closely adjacent corresponding first lines of weakening to define second stubs on each form length at the end thereof opposite said first stubs, said second stubs being only in said remainder of said plies;

means between said first and third lines of weakening securing said remainder of said plies in assembled relation and to said uppermost ply;

additional feeding means extending thru the plies of said assembly in one of said first and second stubs;

indicia on the faces of at least some of said plies in each form length for receiving variable information at designated locations; and

an image transfer medium at the interfaces of said plies for transfering variable information mechanically applied to the face of said uppermost ply to at least some of the underlying plies in each of said form lengths.

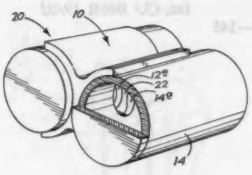
---

**4,213,640**

## COUPLING FOR INTERCONNECTING CONDUITS

**Alfred Miles, 4070 Westcliff Dr., Hood River, Oreg. 97031**

**Filed May 4, 1978, Ser. No. 902,985**
**Int. Cl.² F16L *39/00***
**U.S. Cl. 285—137 R** **7 Claims**




1. An assembly of interconnected conduits comprising:

a first cylindrical conduit having an aperture extending through its wall thickness;

a second cylindrical conduit disposed adjacent said first cylindrical conduit having an aperture extending through its wall thickness; and

coupling means interconnecting said apertures formed as a unitary member having a first wall surface contoured as a cylindrical portion for mating with said first cylindrical conduit and a second, opposed wall surface also contoured as a cylindrical portion for mating with said second cylindrical conduit, said wall surfaces being separated by a thickness through which a substantially unobstructed passage extends, said passage being aligned with said apertures, said first and second conduits being separated by said wall thickness, means for sealing and securing said unitary member to said conduits and for permitting fluid flow through said passage between said first and second cylindrical conduits.

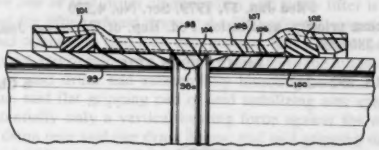
---

**4,213,641**

## FILAMENT WOUND PIPE COUPLING

**Joe B. Bennett, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Dec. 29, 1977, Ser. No. 865,561**
**Int. Cl.² F16L *21/02, 47/00***
**U.S. Cl. 285—369** **5 Claims**




1. A pipe coupling comprising a generally cylindrical, hollow, glass fiber reinforced thermosetting resin body and a glass fiber reinforced thermosetting resin pipe registering means projecting radially inwardly from the body substantially midway between opposite end faces thereof, the body and the pipe registering means each containing glass filament windings, the body having a pair of inner annular grooves respectively adjacent the opposite end faces for the reception of sealing rings, the body having been formed around the pipe registering means immediately after the forming of the pipe registering means and cured simultaneously therewith, and the pipe registering means being separate from but substantially contiguous with the body.

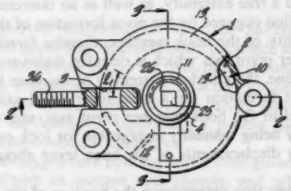
---

**4,213,642**

## ROTARY LATCH AND METHOD OF OPERATION

**L. Richard Poe, Long Beach, and William R. Bourne, Redondo Beach, both of Calif., assignors to Hartwell Corporation, Placentia, Calif.**

**Filed Feb. 12, 1979, Ser. No. 11,193**
**Int. Cl.² E05C *3/04***
**U.S. Cl. 292—241** **9 Claims**



1. A rotary latch for engaging a panel comprising:

rotatable means for latching and unlatching a keeper carried by said panel;

control sleeve means for axially sliding between a first retracted position, in which the outer surface of said control sleeve means is flush with said panel, and a second protruding position, in which said outer surface of said control sleeve means protrudes from said panel;

means for operatively connecting said rotatable means for latching and said control sleeve means;

means for restraining said control sleeve means in said first retracted position and restraining said rotatable means in a latching position;

means for restraining said control sleeve means in said second protruding position and for restraining said rotatable means in an unlatching position upon rotation of said control sleeve means; and

means for secondarily restraining said control sleeve means and restraining said rotatable means in said latching position.

---

**4,213,643**

## KNEE LEVER LOCK FOR AIR FILTER COVERS AND THE LIKE

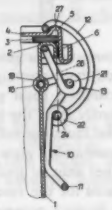
**Karl Blind, Erdmannhausen, and Arthur Klotz, Neckargröningen, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany**

**Filed Jan. 17, 1979, Ser. No. 4,220**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2802006**

**Int. Cl.[2] E05B *5/04***

**U.S. Cl. 292—247** **6 Claims**



1. A knee lever lock for the creation of a quickly releasable clamping connection between two machine elements, as, for example, between the housing and the housing cover of the air intake filter of an automobile engine, the lock comprising in combination:

an elongated hook member having an attached extremity and a free extremity, the attached extremity being a pivot formation and the free extremity being a hook formation adapted to engage one of the two machine elements in the sense of pulling it in the direction of a force line which runs from the hook formation engagement point to the pivot formation of the attached extremity of the hook member;

an elongated knee lever having likewise an attached extremity and a free extremity, as well as an intermediate pivot formation engaged by the pivot formation of the attached extremity of the hook member, thereby forming a hook member pivot axis which is oriented transversely to said force line, the attached extremity of the knee lever being a pivot formation for a knee lever pivot axis which is parallel to the hook member pivot axis, and its free extremity being manually engageable for lock opening and closing displacements of the knee lever about its pivot axis;

a knee lever stop determining the position of the knee lever in the closed position of the lock; and

a pivot anchor having a generally U-shaped outline comprising a yoke portion and two spaced leg portions, the leg portions having angled-off anchoring extremities which are adapted to be snapped into and retained by matching transverse apertures in an outside wall of the other one of the two machine elements, the pivot anchor further including aligned pivot formations in its leg portions, intermediate of their anchoring extremities and the yoke portion, said aligned pivot formations being engaged by the pivot formation of the attached knee lever extremity, thereby determining the location of the knee lever pivot axis, said location being longitudinally between the hook member pivot axis and the hook formation engagement point and at such a distance from the transverse wall apertures of said other machine element that, when the knee lever rests against the knee lever stop, in the closed position of the lock, said force line of the hook member extends between the hook member pivot axis and the transverse wall apertures.

---

**4,213,644**

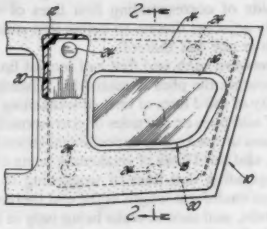
## ENERGY-ABSORBING BUMPER ASSEMBLY

**Jerry V. Scrivo, Durham, and John V. Maloney, Dover, both of N.H., assignors to McCord Corporation, Detroit, Mich.**

**Filed Aug. 17, 1978, Ser. No. 934,359**

**Int. Cl.[2] B60R *19/08***

**U.S. Cl. 293—117** **13 Claims**



1. An automotive body assembly comprising; support structure, bumper means of elastomeric material for compressing to absorb energy in response to an impact, said elastomeric bumper means supported by said support structure forwardly thereof for compression against said support structure, said bumper means having a front face and a recess extending thereinto, light means disposed in said recess and recessed from said front face, and support means connected to said light means and supported by said elastomeric material of said bumper means for moving solely in response to the compression of said elastomeric material of said bumper means to move said light means and to thereafter return said light means to the initial position as said elastomeric material returns to the initial position.

---

**4,213,645**

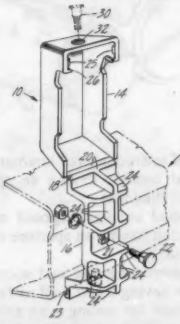
## ONE-PIECE HINGED GUARD

**Edward A. Ruhl, Southfield, Mich., assignor to USM Corporation, Farmington, Conn.**

**Filed Jun. 13, 1978, Ser. No. 915,134**

**Int. Cl.[2] B60R *19/02***

**U.S. Cl. 293—145** **6 Claims**



1. A one-piece molded plastic guard comprising a pair of generally U-shaped sections one of which is foamed and the other of which is non-foamed, the sections being interconnected by a non-foamed hinge portion along a common edge, the foamed section being adapted to be secured to mounting structure and comprised of spaced, compartment-forming ribs defining air pockets, having energy dissipating properties, and

the non-foamed section being closeable on the foamed section and said ribs to provide resistance to impact and protection for said structure.

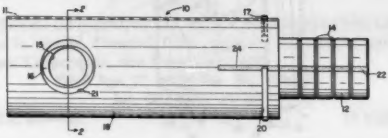
---

**4,213,646**

## RADIOACTIVE SOURCE MANIPULATOR AND STOWAGE DEVICE

**Charles A. Burton, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 29, 1979, Ser. No. 42,836**
**Int. Cl.³ B25B *11/00***
**U.S. Cl. 294—86 A** **6 Claims**



1. A radioactive source manipulator and stowage device comprising:

a cylindrical body;

a transversely disposed socket formed near one end of said cylindrical body for receiving a radioactive source;

a cylindrical sleeve rotatably mounted on said cylindrical body; and

an aperture formed in the wall of said sleeve whereby rotation of said sleeve to axially align said aperture with said socket will permit a radioactive source to be inserted into and removed from said socket and rotation of said sleeve to move said aperture out of alignment with said socket when the socket contains a radioactive source readies the device for manipulation and stowage.

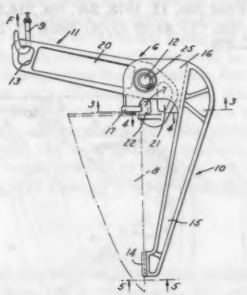
---

**4,213,647**

## DRUM LIFTER

**Elmer T. Thurmond, Jr., Miami, Fla., assignor to Equipment Company of America, Hialeah, Fla.**

**Filed Apr. 19, 1978, Ser. No. 897,577**
**Int. Cl.² B66C *1/66***
**U.S. Cl. 294—90** **1 Claim**



1. For a drum having a shell, top and bottom ends, and a drum chime extending outwardly from each end, a drum lifter for suspending said drum, said drum lifter comprising a lifting arm pivotally connected to a stabilizing arm by a pivot pin, said pivot pin having a pivot axis, said lifting arm being generally L-shaped and having a long arm portion and a short arm portion, the longitudinal axis of said long arm portion being generally transverse to the longitudinal axis of said short arm portion, said lifting arm having a gripping surface on one end and an opening on its other end, said stabilizing arm being generally L-shaped and having an elongated arm portion and a short wide arm portion, the longitudinal axis of said elongated arm portion being generally transverse to the longitudinal axis of said short wide are portion, said short wide are portion being bifurcated into support sections, a flat gripping pad being mounted to the ends of said support sections, a stabilizing pad being mounted to one end of said stabilizing arm, said pivot pin passing through said lifting arm and being pivotally mounted to each of said support sections of said short wide arm portion of said stabilizing arm, said pivot pin axis being located directly above one of said drum chimes when said drum lifter is positioned for lifting of said drum and a lifting force being applied to said opening in said long arm portion, and a plane through the pivot axis of said pivot pin being parallel to the longitudinal axis of said drum and substantially bisecting said one drum chime, said flat gripping pad of said stabilizing arm applying substantially only a vertical bearing force against the end of said drum near said one drum chime, and said gripping surface of said lifting arm applying only a vertical force against the underside of said one drum chime, said vertical force against the end of said drum and said vertical force against the underside of said one drum chime substantially eliminating any horizontal force components against said one drum chime.

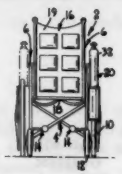
---

**4,213,648**

## OXYGEN TANK HOLDING DEVICE FOR WHEELCHAIRS

**Clemons P. Steichen, 1349 Prosperity Ave., Saint Paul, Minn. 55106**

**Filed Aug. 17, 1978, Ser. No. 934,399**
**Int. Cl.² A47C *7/62***
**U.S. Cl. 297—188** **11 Claims**



1. An improved wheelchair of the type having a frame including two oppositely disposed sides; each side including a support member having means for detachably mounting a foot rest thereon; a plurality of wheels attached to the frame to allow movement of the wheelchair; and patient support means attached to the frame for supporting a patient therein; and wherein the improvement comprises:

at least one oxygen tank holding device configured to releasably support an oxygen tank therein, and wherein the holding device has means for detachably connecting the holding device to the foot rest mounting means on at least one of the support members.

---

**4,213,649**

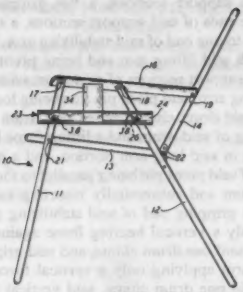
## DRINK CONTAINER HOLDER

**Sanford S. Sell, 1632 Holmes Ave., Racine, Wis. 53405**

**Filed Nov. 17, 1978, Ser. No. 961,616**
**Int. Cl.² A47C *7/62***
**U.S. Cl. 297—189** **7 Claims**

1. An item supporter for a chair having two spaced-apart legs on a side thereof, comprising an item support member including a horizontal portion for supporting items thereon and including an upright portion, two fasteners spaced apart on said upright portion and being pivotally connected thereto by a rivet for pivotal movement of each of said fasteners about the axis of its said rivet, said fasteners including clamp means for attaching to each of said chair legs and have said item support

member extend away from said chair legs with said horizontal portion horizontally disposed, said item support member being C-shaped in end view to present an additional horizontal portion disposed above the first-mentioned said horizontal portion



and with said upright portion extending between said horizontal portions, and said additional horizontal portion having openings therein for receiving said items extending therethrough and being supported on the first-mentioned said horizontal portion.

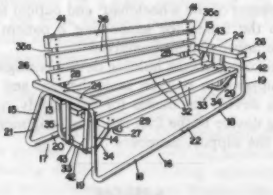
---

**4,213,650**

## GLIDER

Joseph W. Sroub, Parma, Ohio, assignor to Production Experts, Inc., Cleveland, Ohio

Filed Jan. 5, 1979, Ser. No. 1,182
Int. Cl.[2] A47D *13/10*; A47C *7/00*
U.S. Cl. 297—281 5 Claims



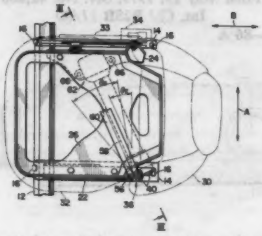
1. In a glider of the character described, a glider seat and back having spaced, longitudinally extending slats, longitudinally-spaced tubular members supporting said slats, and a support frame for said glider seat and back, said frame comprising transversely-spaced tubular U-shaped members disposed in planes which converge toward each other in an upward direction, each of said U-shaped members having a longitudinally-extending floor engaging portion parallel with said slats, and longitudinally-spaced tubular inverted U-shaped members having downwardly-extending divergent arms in alignment with the arms of said transversely-spaced U-shaped members and connected thereto.

**4,213,651**

## SEATBELT SYSTEM

Noritada Yoshitsugu; Masanao Motonami, and Mitsuaki Katsuno, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Jan. 4, 1979, Ser. No. 875
Claims priority, application Japan, Mar. 24, 1978, 53-38185
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—475 8 Claims



1. A seatbelt system for a vehicle comprising:
a passenger seat;
a passenger-restraining seatbelt;
a belt-turning member which is installed on the rear portion of one side of said passenger seat and around which an intermediate portion of said seatbelt is turned so that said seatbelt is extended underneath said passenger seat; and
a retracting mechanism which is fastened to a bottom of said pasenger seat near the opposite side of said seat from said belt-turning member and retracts an end of said seatbelt extended underneath said seat, so that the axis of the portion of said seatbelt extending from said belt-turning member to said retracting mechanism is obliquely oriented with respect to the transverse axis of said vehicle.

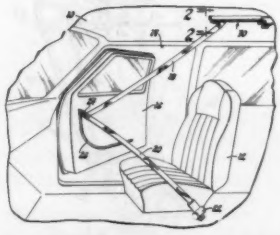
---

**4,213,652**

## LINEAR LOCKING SEAT BELT RETRACTOR

Clarence C. Irwin, Sterling Heights; David F. Manz, Bloomfield Hills, and John T. Auman, Washington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 12, 1978, Ser. No. 914,621
Int. Cl.[2] A62B *35/00*; B60R *21/10*
U.S. Cl. 297—478 3 Claims



1. Mechanism for retracting a seat belt and locking the belt against extension comprising:
a track;
a belt carriage having the belt attached thereto and being mounted on the track for movement therealong in the belt extending direction and the belt retracting direction;
locking means mounted on the belt carriage and adapted for actuation to a locked position engaging the track to lock

the belt carriage against belt extending movement along the track;

a reel;

a flexible element having one end wound on the reel and the other end attached to the locking means;

a winding spring rotating the reel in the direction to wind the flexible element and urge movement of the carriage along the track in the belt retracting direction;

and reel locking means associated with the reel to lock the reel against rotation in the flexible element unwinding direction whereby the flexible element actuates the locking means to the locked position to lock the carriage against belt extending movement along the track.

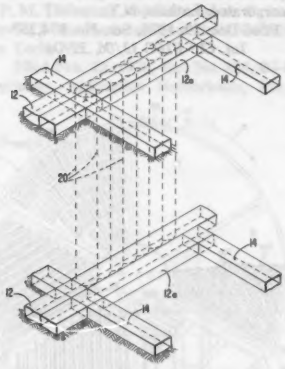
---

**4,213,653**

## METHOD OF MINING OF THICK SEAM MATERIALS

**James D. Grenia, Concord, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.**

**Filed Apr. 17, 1978, Ser. No. 896,824**
**Int. Cl.² E21C *41/00***
**U.S. Cl. 299—11** **11 Claims**



1. A method of mining a thick seam resource material below an overburden comprising: forming a first pair of vertically spaced, generally vertically aligned drifts in the seam; forming a series of overlapping holes in the material of the seam with the holes extending between the drifts; removing the material extracted by the forming of the holes; filling the holes and the first pair of drifts with a load-bearing material to form a bearing wall for use in supporting the overburden; forming, successively, additional pairs of vertically spaced, generally vertically aligned drifts adjacent to respective walls in previously formed drift pairs; and repeating, for each additional pair of drifts, respectively, the hole forming, removing and filling steps to mine a respective part of the seam and to form a respective bearing wall adjacent to a previously formed bearing wall.

---

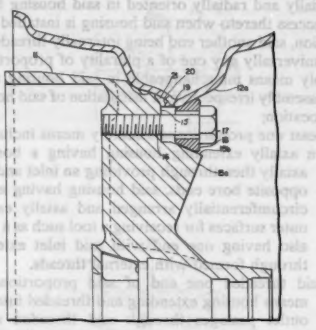
**4,213,654**

## WHEEL RIM WITH NON-SLIP INTERLOCKING DEVICE

**Mitchell J. Furrow, 130 S. Philadelphia St., Anaheim, Calif. 92805**

**Continuation-in-part of Ser. No. 714,842, Aug. 16, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,872**
**Int. Cl.² B60B *23/00***
**U.S. Cl. 301—20** **3 Claims**

1. A wheel and rim assembly for a mobile home trailer comprising a wheel hub having a plurality of circumferentially spaced axially extending raised portions on a front face of the wheel hub adjacent the outer periphery of the wheel hub and each raised portion has a threaded bore, said wheel rim comprising an annular member having a substantially channeled section including a web portion defining an inner periphery of said annular member, said inner periphery having a radially directed surface which is mountable upon said wheel hub, means on said inner periphery radially directed surface comprising a plurality of recesses corresponding in number and peripheral spacing to the plurality of raised portions and surfaces of said recesses engageable with the raised portions for interlocking with a wheel hub to prevent relative rotary movement therebetween, portions of said wheel hub radially in-



wardly of said raised portions protruding axially outwardly of said hub raised portions, a clamp bolt received within said threaded bore, and a clamp having an opening to receive said clamp bolt therethrough and tapering portions of said clamp opposed from each other across said opening engaging radially spaced diverging outwardly areas on said rim and said axial protruding portions of said hub when said clamp bolt is tightened and wedged between said diverging areas to lock the rim upon the wheel hub.

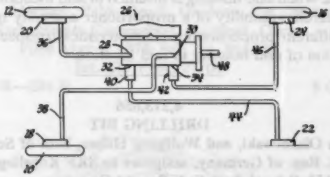
---

**4,213,655**

## MASTER CYLINDER ASSEMBLY AND BRAKE SYSTEM INCORPORATING SAME

**David L. Brademeyer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 16, 1978, Ser. No. 951,586**
**Int. Cl.² B60T *13/00***
**U.S. Cl. 303—6 C** **5 Claims**



1. A universal master cylinder assembly adapted for installation in a location easily accessible for servicing thereof, and having

a housing having an axially extending body with an axially extending bore formed therein,

a plurality of hydraulic fluid pressurizing pistons in said bore and defining in conjunction with said bore a plurality of hydraulic fluid pressurizing chambers,

a plurality of bosses integrally formed as part of said housing and extending outwardly therefrom generally perpendicular to said housing body,

a hydraulic fluid reservoir,

inlet means in at least one of said bosses connecting said reservoir to said bore to provide hydraulic fluid to said

pressurizing chambers and to receive hydraulic fluid from said pressurizing chambers under certain conditions,

and outlet passage means extending through at least another one of said bosses and formed in said housing and including at least one outlet passage for each of said pressurizing chambers, each of said at least one outlet passages having one end opening into and communicating continuously with one of said pressurizing chambers and another end opening exteriorly of said housing boss through which said outlet passage extends, said another end circumferentially and radially oriented in said housing boss for easy access thereto when said housing is installed in said location, said another end being internally threaded to receive universally any one of a plurality of proportioner assembly means interchangeable in said housing to form said assembly irrespective of installation of said housing in said location;

at least one proportioner assembly means including

an axially extending housing having a bore extending axially therethrough providing an inlet and an outlet at opposite bore ends, said housing having a plurality of circumferentially arranged and axially extending flat outer surfaces for receiving a tool such as a wrench, and also having one end with said inlet extended therethrough formed with external threads,

said threaded one end of said proportioner assembly means housing extending and threaded into one of said outlet passages through said threaded another end thereof and being removably secured to said master cylinder assembly housing, said flat outer surfaces providing a purchase for a tool used in installation and removal of said proportioner assembly means,

and pressure proportioning valve means in said proportioner housing bore intermediate said inlet and said outlet for porportioning pressure therethrough within a predetermined pressure range,

at least the one of said outlet passages having the one of said proportioner assembly means secured thereto directly at said outlet passage another end providing continuous hydraulic fluid communication for delivery of hydraulic fluid pressure from at least one of said pressurizing chambers through said at least one outlet passage and through said one proportioner assembly means and thus providing only one additional possible connection leak point in the circuitry served by one of said pressurizing chambers as compared to similar circuitry having no proportioner assembly

therein,

said one proportioner assembly means being removable and replaceable by use of a tool used on said outer surfaces for service when said housing is installed in said location as well as for interchangeability of a proportioner assembly means having different proportioning characteristics irrespective of installation of said housing in said location.

---

**4,213,656**

**DRILLING BIT**

**Armin Olschewski, and Wolfgang Hüber, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany**

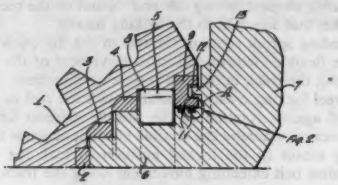
**Filed Sep. 22, 1978, Ser. No. 944,968**

**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1977, 2743825**

**Int. Cl.[2] F16C *33/80***

**U.S. Cl. 308—8.2** **6 Claims**

1. A rotary drilling bit having at least one cutter rotatably supported in a rolling bearing on a trunnion of a drilling bit body, an edge ring provided with a seal fixed in the bored hole of the rotary cutter between rollers of the rolling bearing and the drilling bit body and axially retains the rollers in one direction, characterized in that the edge ring has a machined surface which faces the outside surface of the trunnion defining therebetween a narrow annular gap and in that the seal consists of at least one radially held seal ring arranged in said annular gap; and wherein the side surfaces of the seal ring are provided with spiral grooves which pump outwardly; and wherein the front surface of the edge ring which faces the drilling bit body has an



annular recess defined by two longitudinally extending flanges into which a corresponding axial projection of the drilling bit body engages to form a labyrinth seal.

---

**4,213,657**

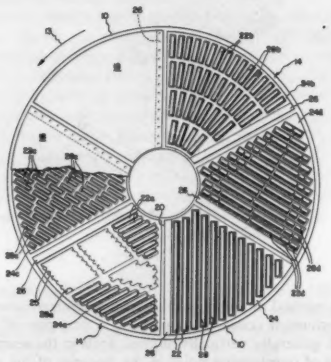
**COMPLIANT HYDRODYNAMIC BEARING WITH TUBULAR SUPPORT ELEMENT**

**Stanley Gray, Skaneateles, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.**

**Filed Dec. 29, 1978, Ser. No. 974,257**

**Int. Cl.[3] F16C *32/06, 39/04***

**U.S. Cl. 308—9** **11 Claims**



1. A compliant, hydrodynamic, fluid film bearing, comprising:

a stationary member and a relatively rotating rotor having a bearing surface, said stationary member and said bearing surface defining therebetween a gap for receiving a composite bearing assembly

a composite bearing assembly received within said gap including a plurality of tubular resilient support elements, a cage member for holding said tubular elements in position, and a bearing sheet overlying and resiliently supported by said tubular support elements.

---

**4,213,658**

**TOOL GUIDE BUSHING MOUNTING ASSEMBLY**

**Nathan O. Shaw, Glendale, Calif., assignor to All American Products Company, Inc., Glendale, Calif.**

**Filed Jun. 11, 1979, Ser. No. 47,547**

**Int. Cl.[3] F16C *35/02***

**U.S. Cl. 308—15** **1 Claim**

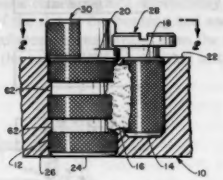
1. A bushing mounting assembly for molding in place in a jig comprising:

a cylindrical liner having a bore therethrough;

a threaded cylindrical sleeve positioned adjacent to said liner with the end of said sleeve in planar alignment with the end of said cylindrical liner;

adhesive means securing said sleeve permanently to said liner;

a locking screw in said threaded sleeve whereby said bushing assembly may be molded in place in a jig with the ends of the liner being flush with the top and bottom surfaces of said jig, said bushing liner assembly adapted to receive slip or fixed renewable bushings or combinations thereof.



---

**4,213,659**

## CONNECTING ROD BEARING ARRANGEMENT

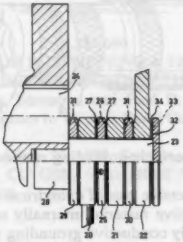
**Leonardus P. M. Tielemans, and Johannes A. G. de Deugd, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 22, 1978, Ser. No. 880,097**

**Claims priority, application Netherlands, Feb. 22, 1977, 7701855**

**Int. Cl.² F16C *3/14***

**U.S. Cl. 308—167** **1 Claim**



1. A bearing arrangement for a connecting rod journalled on a crankshaft pin comprising:

a crankshaft having a crank pin and an elongated cylindrical journal disposed on said pin, a generally planar crankshaft surface substantially perpendicular to and adjoining an axial extremity of said journal,

a plurality of connecting rods each having a big end and an elongated plain cylindrical bearing seated in said big end which cooperates with said cylindrical journal with said plain cylindrical bearings disposed in coaxial relationship; each of said big ends having a generally planar connecting rod surface substantially perpendicular to said cylindrical bearing at each axial extremity thereof, said crankshaft further including a plurality of lubricant supply members rigidly fastened to said crank pin each lubricant supply member of said plurality of lubricant supply members being located intermediate two of said connecting rods, each supply member having first and second axial extremities, each axial extremity of said member including a generally planar surface having shallow lubricant pumping grooves cooperating with one of said generally planar surfaces of said connecting rods which are disposed on each side of each of said lubricant supply members; both sides of said lubricant supply member being beveled around the outer circumference thereof to form a tapered circumferential groove for retaining lubricant.

---

**4,213,660**

## BEARING ASSEMBLY CONSTRUCTION

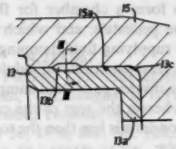
**Yasuyosi Yasui, Toyota; Mitugu Izuta, Okazaki, and Sigeki Okaguchi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**

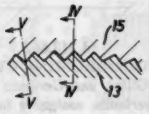
**Filed Feb. 12, 1979, Ser. No. 11,649**

**Claims priority, application Japan, Feb. 15, 1978, 53-16267**

**Int. Cl.² F16C *19/24***

**U.S. Cl. 308—177** **3 Claims**





1. In an axle box structure of soft metal including a bearing bore, a sleeve member of hard metal engaged within said bearing bore, and a rolling bearing assembled within said sleeve member to support an axle shaft thereon,

the improvement wherein said sleeve member has on a portion of its outer periphery an axial knurl or serration means for embedding in said axle box structure, said knurl or serration means being annularly formed in a predetermined axial length substantially at the central portion of said sleeve member wherein the crest diameter of said knurl or serration means is larger than the outer diameter of said sleeve member and the root diameter of said knurl or serration means is smaller than the outer diameter of said sleeve member.

---

**4,213,661**

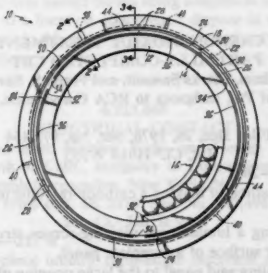
## BEARING SUPPORT STRUCTURE COMBINING FLUID DAMPING AND SPRING DAMPING APPARATUS

**Ronald A. Marmol, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed May 8, 1978, Ser. No. 904,089**

**Int. Cl.² F16C *27/00***

**U.S. Cl. 308—184 R** **5 Claims**



1. In a bearing support structure of the fluid damping type, the improvement comprising:

an inner housing which is adapted to receive a bearing to be supported;

a plurality of arcuate segments extending circumferentially in abutting end to end relationship about said inner housing, wherein each end of each segment has an outwardly extending pedestal and wherein each of said segments has an inwardly extending pedestal spacing said segment apart from the inner housing;

an outer housing which has an inwardly facing surface abutting the outwardly extending pedestals of each arcuate segment to form a chamber for fluid damping medium between the pedestals, and which has at least one inlet conduit for supplying fluid damping medium to the chambers and at least one outlet conduit at each chamber for allowing the discharge of fluid damping medium from that chamber, wherein the sum of the cross sectional areas of the outlet conduits is less than the total inlet conduit, cross sectional area;

and a pair of axially spaced end seals extending between said outer housing and said arcuate segments to inhibit the leakage of damping medium axially from the chambers.

---

**4,213,662**

**TUNGSTEN/BROMINE CYCLE LAMP**

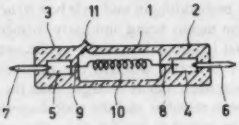
**Henricus F. J. I. Giller, and Germain R. T'Jampens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Division of Ser. No. 788,424, Apr. 18, 1978, Pat. No. 4,128,783. This application Aug. 15, 1978, Ser. No. 933,868**

**Claims priority, application Netherlands, May 10, 1976, 7604953**

**Int. Cl.[2] H01J *9/38***

**U.S. Cl. 316—24** **4 Claims**




1. A method of manufacturing a tungsten/bromine cycle lamp which comprises: providing a transparent lamp vessel, providing a tungsten filament in said vessel, introducing a dispersion of a compound of the formula $MeH_xBr_yC_z$ into said vessel, in which formula z has the value 0, Me is vanadium, niobium or tantalum, x=1, 2 or 3 and y=x+1, evaporating and expelling the solvent of said dispersion from said vessel, filling said lamp vessel with an inert gas and sealing said lamp vessel.

---

**4,213,663**

**WET CARBON-DIOXIDE TREATMENT OF PARTIALLY-COMPLETED CRT**

**Jawdat I. Nubani, Clarks Summit, and Frank S. Sawicki, Scranton, both of Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Dec. 26, 1978, Ser. No. 973,454**

**Int. Cl.[2] H01J *9/395***

**U.S. Cl. 316—24** **8 Claims**

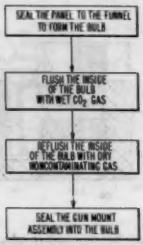
1. In the method of making a cathode-ray tube including the steps of

(i) producing a luminescent viewing-screen structure upon the inner surface of a faceplate panel,

(ii) heat sealing said panel to the large opening of a funnel to form a virgin bulb,

(iii) flushing said virgin bulb with a dry noncontaminating gas,

(iv) and then heat sealing a mount assembly to the small opening of said funnel,


SEAL THE PANEL TO THE FUNNEL TO FORM THE BULB
FLUSH THE INSIDE OF THE BULB WITH WET $CO_2$ GAS
REFLUSH THE INSIDE OF THE BULB WITH DRY NONCONTAMINATING GAS
SEAL THE GUN MOUNT ASSEMBLY INTO THE BULB

the step subsequent to step (ii) and prior to step (iii) of flushing the inside of said virgin bulb with wet carbon-dioxide gas.

---

**4,213,664**

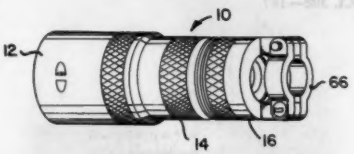
**VISUALLY INSPECTABLE GROUNDING CONNECTOR FOR ELECTRICAL CABLE**

**Warren G. McClenan, 7009 Coldwater Canyon, #4, North Hollywood, Calif. 91605**

**Filed Oct. 11, 1978, Ser. No. 950,322**

**Int. Cl.[2] H01R *3/06***

**U.S. Cl. 339—14 R** **6 Claims**




1. A visually inspectable grounding connector for electrical cable comprising:

a coaxially connectable pair of cylindrical members of electrically conductive material internally supporting an annular electrically conductive grounding means of radially contractable structure;

said pair of members internally containing means to radially contract said grounding means as a function of telescoping connecting movement of said pair of members;

said pair of cylindrical members and said means to radially contract said grounding means together defining a least diameter affording an unobstructed line of sight from one end of one of said pair of members to the radially inner portion of said grounding means after said pair of members have been telescopically connected to fully radially contract said grounding means onto an electrical cable.

---

**4,213,665**

**ELECTRICAL CONNECTOR**

**Ronald A. Murray, Methuen, and Gary P. Piccirillo, Worcester, both of Mass., assignors to TRW Inc., Cleveland, Ohio**

**Filed Apr. 9, 1979, Ser. No. 28,465**

**Int. Cl.[2] H05K *1/18*; G09F *9/00***

**U.S. Cl. 339—17 D** **23 Claims**

1. An electrical connector comprising:

A. a housing, said housing including:

(1) a first section defining a pair of spaced-apart flexible, resilient walls with a slot between them;

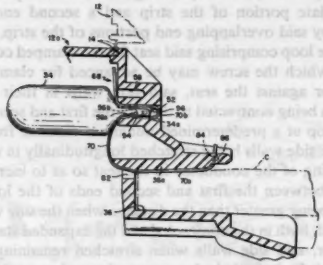
(2) a second section defining a row of compartments extending parallel to the slot;

(3) a hinge between said housing sections allowing the two sections to be superimposed so that the compartments overlie the slot at spaced-apart locations therealong;

(4) means for retaining the two sections in their superimposed condition; and

B. a flexible printed circuit, said circuit including:

(1) a flexible electrically insulating substrate, one dimension of the substrate being not appreciably greater than the length of the slot in the housing and another dimension of the substrate being greater than the depth of said slot so that the substrate can be folded into the housing



slot so that at least one end portion of the substrate projects from the slot;

(2) at least one pair of electrically isolated conductive paths secured to the substrate, corresponding first lengths of said paths being positioned at spaced-apart locations along the housing slot and corresponding second lengths of said paths being positioned on the substrate portion projecting from the slot.

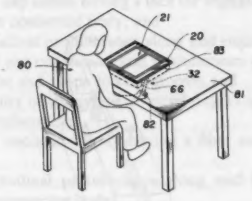
---

**4,213,666**

## MECHANISM FOR POSITIONING A TEST ADAPTER IN OPERATIVE RELATIONSHIP WITH A RECEIVER

**Paul A. Braginetz, Staunton, and Paul D. Floyd, Lyndhurst, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.**

**Filed Jan. 26, 1979, Ser. No. 6,572**
**Int. Cl.[3] G05G 9/00; H01R 13/62**
**U.S. Cl. 339—75 M** **6 Claims**



1. In an arrangement for positioning an individual test adapter in full operative engagement with a receiver for said test adapter and wherein the test adapter and receiver each has multiple contacts resisting such full operative engagement, and wherein the receiver has an eccentric cam means engaging with a surface formed in the individual test adapter to cause movement of the test adapter toward said full operative engagement responsive to rotation of the eccentric cam means in one direction, the combination with said eccentric cam means of a short stroke low effort force multiplying and motion amplifying mechanism on said receiver and coupled with said eccentric cam means and including a manual operating lever, said receiver having a side rail provided with a recess for said mechanism, said mechanism comprising plural connected elements including said lever disposed within the confines of said recess and being movable therein between locking and release positions of said mechanism, said recess having an end abutment surface which is engaged by said lever to limit movement of the lever in one direction and is engaged by another element of said mechanism to limit movement of the lever in the opposite direction, and said mechanism further comprising a fulcrum arm pivoted to said side rail in said recess and having a pivotal sliding connection with said lever, said lever being pivoted to said side rail within said recess, a floating connecting link within said recess and having a pivotal connection with said fulcrum arm, and a cam arm within said recess having a pivotal connection with said connecting link and being driven thereby and being directly secured to said eccentric cam means.

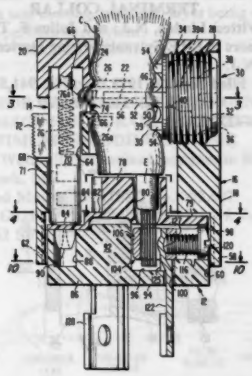
---

**4,213,667**

## DEAD FRONT CONNECTOR

**James M. Wittes, Linden, N.J., assignor to GTE Sylvania Wiring Devices Incorporated, Trenton, N.J.**

**Filed May 30, 1978, Ser. No. 910,569**
**Int. Cl.[2] H01R 13/58**
**U.S. Cl. 339—103 R** **38 Claims**



1. An electrical connector of the type attachable to an end portion of a power cable, comprising:

(a) a support for a contact housing including a body having a bore for receiving the end portion of a cable, and means mounted on the body for movement across the bore into clamping engagement with said power cable end portion;

(b) a contact housing separably assembled with said body and including contacts connectable to the end portion of the cable; and

(c) lock means mounted between the body and the contact housing for travel along a path between a locking position preventing relative separation of the contact housing and body and an unlocking position permitting such separation, said first named means being adapted to bias the cable portion to a location effective to dispose in said path an abutment blocking travel of the lock means from its locking position.

---

**4,213,668**

## ELECTRICAL CONTACT

**David S. Goodman, Mission Viejo, and George I. Stanfield, Tustin, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

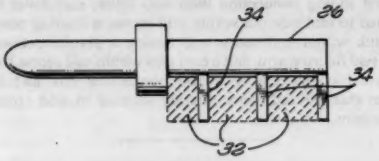
**Filed Oct. 10, 1978, Ser. No. 949,496**
**Int. Cl.[3] H01R 9/02**
**U.S. Cl. 339—217 R** **3 Claims**

1. A one-piece unitary right-angle electrical contact comprising:

an elongated, solid body having a cylindrical forward mating end and a rear termination end;

said rear-termination end including a cylindrical portion

coaxial with said cylindrical forward mating end and a plurality of terminal posts each of rectangular cross-section integral with said cylindrical portion; and




said terminal posts extending transversely in the same direction from said cylindrical portion and lying in a common plane passing through the center axis of said cylindrical portion.

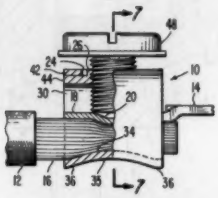
---

**4,213,669**

## TERMINAL COLLAR

**James M. Wittes, Linden, N.J., and Julius F. Tibolla, Yardley, Pa., assignors to GTE Sylvania Wiring Devices Incorporated, Trenton, N.J.**

**Filed Sep. 11, 1978, Ser. No. 941,534**
**Int. Cl.³ H01R *11/10***
**U.S. Cl. 339—272 UC** **1 Claim**




1. In a terminal collar of the type including a yoke, a screw threadedly engaged therein, and a pressure plate adapted to be advanced by the screw into clamping engagement with a conductor inserted in the yoke, the improvement comprising: an elongated strip of metal the end portions of which are brought into an overlapped relationship to shape said strip as a closed loop, one of the end portions having a threaded opening through which the screw may be advanced within the yoke and the other end portion having a smooth-walled clearance aperture in registration with the threaded opening and through which the screw extends into engagement with the threads of the opening, said yoke including a rigidly constituted seat for said conductor facing said screw and opposed resiliently extensible side walls at opposite sides of the seat, said side walls being stressed and placed under tension responsive to clamping of a conductor within a yoke, whereby to accommodate the yoke without loss of clamping force to contraction and expansion of the conductor while clamped within the yoke; and inter-engaging means on the overlapping end portions limiting the same, upon stressing of the side walls, against relative movement in directions tending to open said loop, said side walls when stressed remaining within their elastic limits in both the contracted and expanded states of the conductor, the side walls of the yoke being pre-formed, substantially midway between the seat and the overlapping end portions, with shallow reentrant angles which open in the stressed condition of the side walls and exert a contractile force on the side walls effective to maintain a tight clamping pressure on the conductor in both the contracted and expanded conditions thereof, said side walls having parallel, straight first portions adjacent the seat spaced apart a distance to snugly, slidably receive and guide said pressure plate toward the seat when the pressure plate is advanced by the screw, the side walls respectively having second portions into which the first portions merge and which extend in diverging paths in a direction away from the seat to cooperate with the first portions of the side walls in defining the respective reentrant angles, the second portions being continued along said diverging paths fully to the respective, overlapping end portions and merging directly into the overlapping end portions along curved bend lines located at the point of greatest divergence of the second portions of the side walls and generally coplanar with the respective overlapping end portions, said loop having a first end comprised of an intermediate portion of the strip and a second end that is formed by said overlapping end portions of the strip, the first end of the loop comprising said seat for the clamped conductor toward which the screw may be advanced for clamping the conductor against the seat, said side walls in their stressed condition being contracted to dispose the first and second ends of the loop at a predetermined minimum distance from each other, the side walls being stretched longitudinally in response to clamping of the conductor in the seat so as to increase the distance between the first and second ends of the loop, said distance being greater than the distance when the side walls are unstressed, both in the contracted and the expanded state of the conductor, said side walls when stretched remaining within their elastic limits both during contraction and expansion of the conductor, said seat being shaped to present an inward convexity to the conductor defining flared entrance and exit ways for the conductor and a relatively inflexible anvil therebetween against which the conductor is clamped.

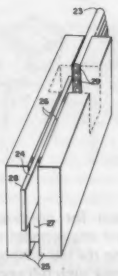
---

**4,213,670**

## PLANAR FIBER OPTIC STAR AND ACCESS COUPLER

**A. Fenner Milton, Washington, D.C., and Thomas G. Giallorenzi, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 6, 1977, Ser. No. 841,859**
**Int. Cl.² G02B *5/14***
**U.S. Cl. 350—96.16** **9 Claims**




1. A planar fiber optic star and access coupler element for use with minibundles of multimode fibers or single fibers as the transmission line which comprises:

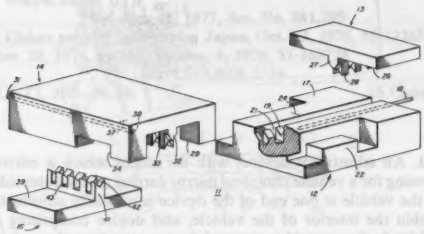
a short length of high-aspect-angle, clad ribbon fiber which is rectangular in cross section along both width and length dimensions, and is in end-to-end abutting relationship with said transmission line,

said clad ribbon fiber aligning with said transmission line such that all radiation is transmitted from said transmission line into the adjacent end of said clad ribbon fiber or from said ribbon fiber to the adjacent end of said transmission line except for packing fraction losses.

## 4,213,671
## FIBER OPTIC CONNECTORS AND METHODS OF AFFIXING OPTICAL FIBERS THERETO

Gary M. Lambert, Berlin, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 12, 1979, Ser. No. 19,961
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.21 4 Claims



1. A fiber optic connector comprising:

(a) a first connector body having a fiber engaging face and

(i) a longitudinal groove along said face of said first connector body;

(ii) A plurality of transverse slots spaced along said groove;

(iii) body engaging means; and

(iv) reference means associated with said groove for indicating where a face of a first fiber to be coupled should be aligned;

(b) a first end cap means having a face for engaging a portion of said first connector body; and

(i) a longitudinal protuberance along said engaging face of said first end cap means, said protuberance corresponding in size and shape to said groove; and

(ii) a plurality of transverse inverted fingers spaced along said protuberance;

(c) a second connector body having a fiber engaging face and

(i) a longitudinal protuberance along said face of said second connector body;

(ii) a plurality of transverse inverted fingers spaced along said second connector body protuberance

(iii) body engaging means;

(iv) reference means associated with said second body protuberance for indicating where a face of a second fiber to be coupled should be aligned; and

(d) a second end cap means having a face for engaging a portion of said second connector body and

(i) a raised longitudinal extension having a groove therein along said face of said second end cap; and

(ii) a plurality of transverse slots spaced along said second end cap means groove; and wherein

upon proper mating of said first connector body with said second connector body, said body engaging means of said first connector body engages with said second connector body, and said body engaging means of said second connector body engages with said first connector body.

## 4,213,672
## LIGHT WAVEGUIDE WITH A HIGH TENSILE STRENGTH

Hubert Aulich; Nikolaos Douklias, both of Munich; Heinz Hacker, Nurenberg, and Guenter Zeidler, Unterpfaffenhofen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

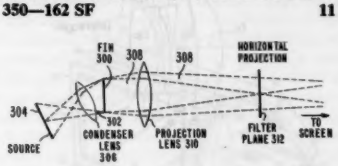
Filed Jun. 22, 1978, Ser. No. 917,782
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729648
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.23 3 Claims

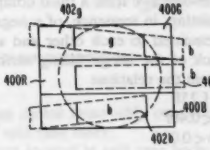
1. In a light waveguide having a good tensile strength including a light conducting fiber being coated with a plastic coating to improve the tensile strength, the improvement comprising said plastic coating having a thickness of at least 2 μm and being uniformly concentrically applied directly onto the surface over the entire length of the light conducting fiber without any surface defects, said plastic coating being a high temperature stable material having a softening temperature of at least 150° C. and being a polyesterimide, and a slide layer being disposed on said coating, said slide layer being of polytetrafluoroethylene-perfluoropropylene.

## 4,213,673
## PROJECTOR FOR READING OUT COLOR-ENCODED FOCUSED IMAGE HOLOGRAMS EMPLOYING AN OPTIMUM ENCODING SCHEME

Michael T. Gale, Wettswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed May 8, 1978, Ser. No. 903,687
Int. Cl.[2] G02B 27/18, 27/38; G03H 1/24, 1/28
U.S. Cl. 350—162 SF 11 Claims




1. In a projector for displaying a color picture derived from a focused image hologram situated in a given plane, said hologram being of the type comprising a plurality of plane-parallel diffraction gratings each of said gratings having a different specified angular orientation in said given plane and a different specified constant spatial frequency and being modulated in accordance with a different color component of said color picture to form a spatial carrier for that color component; said projector including first means for illuminating said hologram with an incident non-coherent light beam inclined at a predetermined angle with respect to the normal to said given plane, said non-coherent light beam having a given spectrum which includes a spectral wavelength portion corresponding to each respective one of said color components, and second means responsive only to first diffraction-order output light derived from said respective gratings for projecting said color picture on a viewing screen; the improvement therein:

(a) wherein said first diffraction-order output light derived

from each respective one of said gratings is individually dispersed into a separate spectrum of light corresponding to said given spectrum that has an individual spatial location determined by the specified angular orientation and specified spatial frequency of that one grating;

(b) wherein said second means includes a plurality of spatially separated color filters having predetermined spatial locations, at least one of said color filters corresponding in color to each different one of said color components, and

(c) said specified angular orientations and specified spatial frequencies of said respective gratings being such that the spatial location of the wavelength spectral position corresponding to any and every certain one of said color components of each of said spectra of light intersects the spatial location of a color filter corresponding in color to said certain one of said color components solely for the spectrum of light which is derived from that one of said gratings which is modulated in accordance with said certain one of said color components.

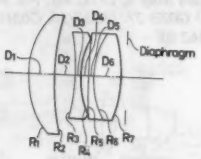
---

**4,213,674**

## TESSAR FORM PHOTOGRAPHIC LENS

**Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 18, 1978, Ser. No. 952,401**
**Claims priority, application Japan, Oct. 20, 1977, 52-126332**
**Int. Cl.² G02B 9/20**
**U.S. Cl. 350—227** **6 Claims**




1. A Tessar form of photographic lens comprising, from the object end, a first component having a positive meniscus lens having a convex surface facing the object end, a second component having a bi-concave lens, a third component having a doublet lens consisting, in sequence, of a negative lens and a bi-convex lens cemented to each other and a diaphragm arranged at the back of the image facing surface of the third component, wherein the relations

(1) $1.1f<TL<1.25f$
(2) $0.35f<TD<0.40f$
(3) $0<Da-Db<0.07f$
(4) $0.06f<D_2<0.1f$
(5) $0.025f<D_4<0.04f$
(6) $0.36f<R_1<0.4f$
(7) $0.33f<R_4<0.38f$
(8) $0.34f<R_6<0.4f$

are satisfied, and wherein

TL is the distance between the first lens surface of the lens (set at the infinite distance) and the image plane along the optical axis

TD is the total lens thickness along the optical axis

Da is the distance between the first and the third lens surface

Db is the distance between the fourth and the seventh lens surface

$D_2$ is the distance between the first and the second lens surface

$D_4$ is the distance between the fourth and the fifth lens surface, and

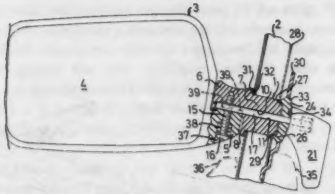
$R_1$, $R_4$, $R_6$ are the respective radii of curvature of the first, the fourth and the sixth lens surface.

**4,213,675**

## INTERIORLY ADJUSTABLE OUTSIDE REAR VIEW MIRROR FOR VEHICLES

**Stig T. L. Pilhall, Trollhättan, Sweden, assignor to AB Volvo, Goteborg, Sweden**

**Filed Apr. 4, 1979, Ser. No. 27,090**
**Claims priority, application Sweden, Apr. 19, 1978, 7804455**
**Int. Cl.² G02B 5/08**
**U.S. Cl. 350—307** **7 Claims**




1. An adjustment device, with the aid of which a mirror housing for a vehicle rear view mirror carried on the outer side of the vehicle at one end of the device is manually adjustable within the interior of the vehicle, said device comprising a holder body rotatably mounted in an extending through a through-hole in a wall portion associated with the vehicle body, e.g. a front door, characterized in that the holder body is axially fixed in the through-hole by means of stop means abutting against at least two surfaces associated with the body wall portion and facing in opposite directions, at least one of the stop means being arranged on the holder body, and that in the holder body there is provided a cavity wherein there is pivotally disposed an arm having an outer portion situated outside the body wall portion, said outer portion being torque transmitting interconnected with the mirror housing for pivoting movement thereof in relation to the holder body, and an inner portion protruding from the end of the holder body on the inner side of the body wall portion, there to carry a grip portion which, by means of an adjusting means attached to the arm, is biased against a stop portion disposed at the end of the holder body, one of the stop means being rigidly attached to said stop portion.

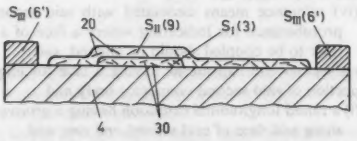
---

**4,213,676**

## LIQUID CRYSTAL DISPLAY FOR REFLECTION OPERATION WITH A GUEST-HOST LIQUID CRYSTAL LAYER AND METHOD OF MAKING

**Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland**

**Filed Jul. 19, 1977, Ser. No. 817,009**
**Claims priority, application Switzerland, Aug. 10, 1976, 10164/76**
**Int. Cl.² G02F 1/13**
**U.S. Cl. 350—336** **8 Claims**




1. A liquid crystal display for reflection operation, including a guest-host liquid crystal layer disposed between front and rear cell plates and respective front and back electrodes, and a diffuse reflector integrated in the interior of the cell, at least said front cell plate and said front electrode being transparent, wherein:

said back electrode and its supply line comprise a screen

printed layer of ink comprising metal particles and a binder sintered in a heating process to form an electrically conductive sintered layer having a thickness of 1–3 μm; and

said reflector comprises insulated metal particles applied to said back electrode and the inner surface of said rear cell plate.

---

4,213,677

## LIGHT COUPLING AND BRANCHING DEVICE USING LIGHT FOCUSING TRANSMISSION BODY

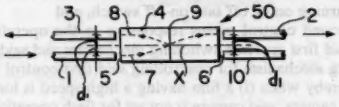
Shigetoki Sugimoto; Ro Ishikawa, and Shigeo Matsushita, all of Tokyo, Japan, assignors to Nippon Selfoc Company, Limited, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,290

Claims priority, application Japan, Oct. 13, 1976, 51-122653; Nov. 30, 1976, 51-144279; Dec. 6, 1976, 51-163728

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.18 15 Claims




1. A light branching and coupling device comprising a light focusing transmission body having a refractive index distribution, in which the refractive index gradually decreases from the center towards the periphery of said body in a cross section thereof perpendicular to the center axis of said body whereby light incident on one of two end faces perpendicular to said center axis of said body propagates undulatingly to the other end face at a predetermined pitch, said light focusing transmission body having a length equal to a positive integral multiple of substantially ¼ pitch; and

reflecting means positioned at a predetermined distance from said one end face of said light focusing transmission body along said center axis, said predetermined distance being an odd number multiple of substantially ¼ pitch.

---

4,213,678

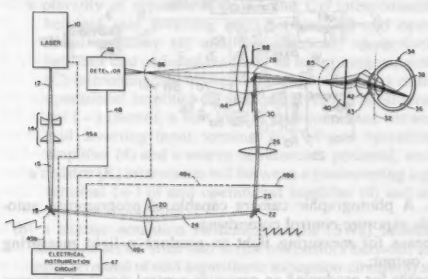
## SCANNING OPHTHALMOSCOPE FOR EXAMINING THE FUNDUS OF THE EYE

Oleg Pomerantzeff, Brookline, and Robert H. Webb, Charlestown, both of Mass., assignors to Retina Foundation, Boston, Mass.

Filed Sep. 29, 1977, Ser. No. 837,870

Int. Cl.² A61B 3/10, 3/14

U.S. Cl. 351—7 14 Claims




1. A scanning ophthalmoscope for providing a visual representation of an eye fundus under scanned illumination, said ophthalmoscope having the improvement comprising

A. scanning laser source means for projecting a fundus-illuminating laser beam which scans according to a selected scanning sequence,

B. optical means

for directing said scanning laser beam through a pivot point in a plane having a location selected relative to the laser beam for receiving the pupil of the eye being examined for introducing the scanning laser beam into an eye so located through a small portion only of the eye pupil, and

for directing said scanning beam to travel from said pivot point onto a wide-angle region of the fundus of the eye located with the eye pupil at said selected plane,

C. optical detecting means for receiving light reflected from the eye fundus in response to illumination with said scanning beam, said detecting means being arranged for receiving light which traverses from within the eye through at least a major portion of the eye pupil, and for producing an electrical signal in response to the received light and with correspondence to said scanning sequence, and

D. output means for providing a fundus-imaging output representation in response to said electrical signal.

---

4,213,679

## PROJECTOR

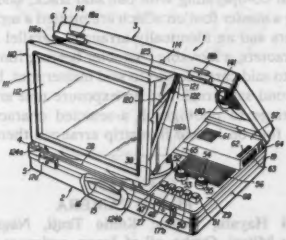
Kiyoshi Sakamoto, Hyogo; Yukio Tsukakoshi, and Naoyuki Oie, both of Kasai, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 2, 1978, Ser. No. 882,748

Claims priority, application Japan, Mar. 18, 1977, 52-34620[U]

Int. Cl.² G03B 21/30

U.S. Cl. 353—72 3 Claims



1. A film projector comprising:

a case body;

a case cover;

separable hinge means removably connecting said cover to one side of said case body;

projector means located in said case body;

a projection window through which the image projected by the projector means is transmitted disposed in said case body facing the inner surface of said case cover;

collapsible rear projection screen assembly means mounted in the inside of said case cover and including means adapted to engage said case body to support the screen assembly means and the case cover at a predetermined angle relative to said case cover when the cover is unfolded;

a mirror disposed at the inside of said case cover for reflecting and rear projecting the image from said projection window onto said screen assembly means; and

retractable support means mounted on a side of said case body, said retractable support means adapted to change its span from a housed position where its supporting width does not exceed the thickness of said side of said case body to an extended position where its supporting width exceeds the thickness of said side of said case body, said support means when in said extended position being capable of supporting thereon said case body with said case

cover removed therefrom so that the image can be front projected.

---

**4,213,680**

## SETTING APPARATUS

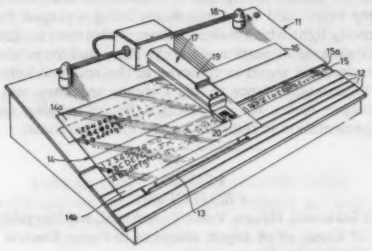
**Gary W. Gillot, 2, Sedgmoor Rd., Flackwell Heath, and David H. Wright, 4, Horton Gardens, Horton, both of England**

**Filed Nov. 13, 1978, Ser. No. 960,279**

**Claims priority, application United Kingdom, Nov. 16, 1977, 47613/77**

**Int. Cl.[2] B41B *17/02***

**U.S. Cl. 354—12** **5 Claims**



1. An apparatus for visually setting type in which characters are recorded sequentially on film by a photographic device arranged thereabove, comprising a carriage, a film-strip mounted on said carriage, at least two parallel tracks arranged on said carriage, a displaceable font carriage provided with means for co-operating with one said track, said font carriage carrying a master font on which are printed a series of negative characters and an identically arranged parallel series of positive characters, a movable character bearing font, displaceable relative to said carriage and to said master font, being movable on a second said track and an exposure unit arranged above said carriage to photograph a selected character from said negative font on to said film-strip arranged therebelow.

---

**4,213,681**

## FLASH CAMERA

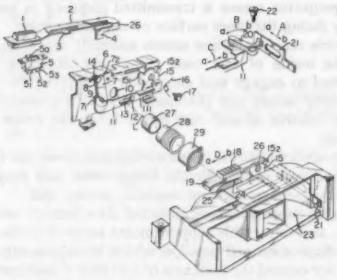
**Toshinori Hayata, Osaka; Kunio Tsuji, Nagaokakyo, and Hajime Mitsui, Osaka, all of Japan, assignors to West Electric Co., Ltd., Osaka, Japan**

**Filed Apr. 12, 1978, Ser. No. 895,761**

**Claims priority, application Japan, Apr. 19, 1977, 52-45329; Apr. 19, 1977, 52-45330; Apr. 19, 1977, 52-45331**

**Int. Cl.[2] G03B *3/00, 7/00, 9/04, 15/05***

**U.S. Cl. 354—21** **5 Claims**



1. A flash camera comprising in combination a camera and an electronic flash, said electronic flash including:

(a) a DC-DC converter for stepping up a low DC voltage supplied from a DC power source to a high DC voltage which in turn is stored in a main flash capacitor,

(b) a flash lamp for converting the energy stored in said main flash capacitor into a flash of light, and

(c) a power on-off switch for selectively connecting said power source to said DC-DC converter or disconnecting said power source from said DC-DC converter; and

said camera including:

(d) a first aperture switching mechanism responsive to a speed of a film loaded into said camera for selecting an iris opening of corresponding diameter, the axis of said iris opening being coaxial with the optical axis of a lens system,

(e) a focusing mechanism for focusing said lens system on a subject, and

(f) a second aperture switching mechanism responsive to the operation of said on-off switch for selecting said iris opening in cooperation with said first aperture switching mechanism and said focusing means, said second aperture switching mechanism comprising:

a first control means upon which is mounted a knob for turning on or off said on-off switch, and

a second control means responsive to the operations of said first aperture switching mechanism and said focusing mechanism for controlling said first control means,

whereby when (i) a film having a high speed is loaded in said camera, said camera is not set for flash operation with focusing on a subject at a long distance therefrom, said first aperture switching mechanism may select said small-diameter iris opening, when (ii) said high-speed film is loaded in said camera, the power on-off switch is in the on position and said focusing mechanism is focused at a subject at a long distance from said camera said first control means causes said first aperture switching mechanism to select said large diameter opening, and when (iii) a film having a low speed is loaded in said camera, said first aperture switching mechanism may select said large-diameter opening and said second control means may prevent the switching operation of said first aperture switching mechanism caused by said first control means.

---

**4,213,682**

## PROGRAMMED EXPOSURE CONTROL SYSTEM FOR A CAMERA

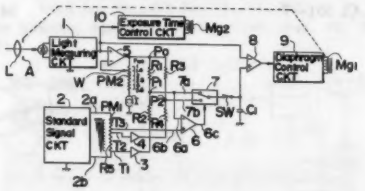
**Seiji Yamada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 12, 1978, Ser. No. 968,755**

**Claims priority, application Japan, Dec. 27, 1977, 52/159598**

**Int. Cl.[2] G03B *7/08***

**U.S. Cl. 354—23 D** **13 Claims**




1. A photographic camera capable of programmed automatic exposure control comprising:

means for measuring light to produce a light measuring output;

means for producing an exposure control signal in response to the light measuring output;

means for automatically varying both the time value signal and aperture value signal as a first function of the magnitude of the exposure control signal when said magnitude is in a first range of exposure control signal magnitudes, and

as a second function of the magnitude of the exposure control signal when said magnitude is in a second range of exposure control signal magnitudes;

means for determining the aperture size in response to the aperture value signal; and

means for determining the exposure time in response to said time value signal.

---

**4,213,683**

## ELECTRONIC SHUTTER DRIVING DEVICE FOR CAMERA

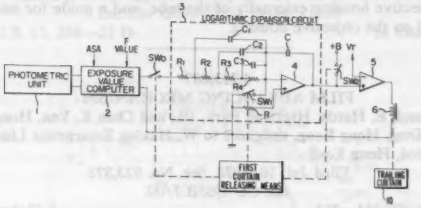
**Masamichi Furukawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jul. 12, 1978, Ser. No. 923,903**

**Claims priority, application Japan, Jul. 18, 1977, 52/85752; Aug. 24, 1977, 52/101427**

**Int. Cl.[2] G03B 7/08; G06G 7/24**

**U.S. Cl. 354—24** **4 Claims**




1. An electronic shutter driving device comprising a photometric unit for measuring brightness of a subject and generating an output signal which is a logarithmic compression of said brightness, an exposure value computer responsive to the output signal from said photometric unit, a logarithmic expansion circuit having an input terminal coupled to the output of said exposure value computer, a comparator having positive and negative input terminals for comparing the output from said logarithmic expansion circuit with a reference voltage, a first curtain releasing means, and an electromagnet coupled to the output of said comparator which is energized to hold a second curtain and de-energized to release said second curtain a predetermined time interval after said first curtain was released, characterized in that

(a) said logarithmic expansion circuit (3) comprises

an operation amplifier (4),

a series of resistors ($R_1$, $R_2$, $R_3$ and $R_4$) interconnected between an output terminal of said exposure value computer and an inverting input terminal (−) of said operational amplifier (4) through an input terminal of said logarithmic expansion circuit,

a plurality of capacitors ($C_1$, $C_2$ and $C_3$) interconnected between said inverting input terminal of said operational amplifier (4) and the junctions, respectively, between said series of resistors, an integrating capacitor (C) interconnected between the output terminal of said operational amplifier (4) and said inverting input terminal (−) thereof, a first switch interconnected between said inverting input terminal (−) of said operational amplifier (4) and a source of reference potential, and

a resistor (R) interconnected between a noninverting input terminal (+) of said operational amplifier (4) and said reference potential;

(b) a shutter actuation switching means ($SW_0$) interconnected in series with said series of resistors between said input terminal of said logarithmic expansion circuit (3) and said output terminal of said exposure value computer;

(c) a second switch ($SW_2$) interconnected between a voltage source (+B) and the noninverting input terminal of said comparator (5);

(d) the output terminal of said logarithmic expansion circuit (3) being connected to the noninverting input terminal of said comparator (5), means for applying a reference voltage to the inverting input terminal of said comparator (5);

(e) such that prior to the actuation of a shutter release, said shutter actuation switch ($SW_0$) remains opened while said first and second switches ($SW_1$ and $SW_2$) remain closed, but when said shutter release is actuated, said shutter actuation shutter ($SW_0$) is closed while said first and second switches ($SW_1$ and $SW_2$) are opened so that said logarithmic expansion circuit (3) starts integration so as to determine an optimum shutter speed, said electromagnet being de-energized to release the second curtain when the output voltage from said logarithmic expansion circuit (3) traverses the level of said reference voltage ($V_r$).

---

**4,213,684**

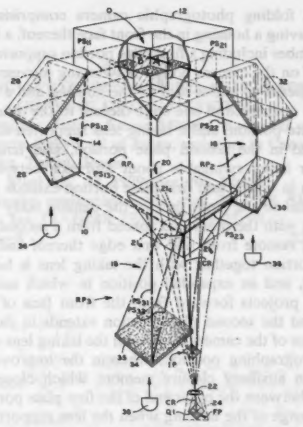
## SYSTEM FOR FORMING A QUADRIFID IMAGE COMPRISING ANGULARLY RELATED FIELDS OF VIEW OF A THREE DIMENSIONAL OBJECT

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Frederick R. Chamberlain, Sun Valley, Calif.**

**Filed Mar. 20, 1978, Ser. No. 888,432**

**Int. Cl.[2] G02B 5/08; G03B 15/02, 41/00**

**U.S. Cl. 354—118** **2 Claims**



1. In a system for simultaneously forming a quadrifid image at the film plane of a camera consisting of three equally well focused separate images of a plurality of angularly related fields of view of a common three dimensional object, the improvement comprising:

A. a first reflective means adjacently related to a three dimensional object including surfaces for reflecting an image of a field of view of a first object plane of said object along a first folded path of a given length extended between the first object plane and a film plane of a camera;

B. second reflective means adjacently related to the three dimensional object including a plurality of surfaces for reflecting an image of a field of view of a second object plane of said object angularly related to said first object plane along a second folded path having a length equal to the length of the first folded path and extended between the second object plane and the film plane;

C. third reflective means adjacently related to the three dimensional object including a third plurality of surfaces for reflecting an image of a field of view of a third object plane of said object angularly related to said first object plane along a third folded path having a length equal to the lengths of the first and second paths and extended between the third object plane and the film plane; and

D. means for illuminating each of the object planes including

a beam splitter disposed in each of said folded paths and a source of light optically coupled with each of the beam splitters for propagating beams of light along axes extended toward said object.

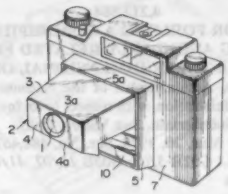
---

**4,213,685**

## FOLDING TYPE PHOTOGRAPHIC CAMERA

**Takao Koda, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan**

**Filed Feb. 14, 1979, Ser. No. 12,230**
**Claims priority, application Japan, Feb. 18, 1978, 53-17915**
**Int. Cl.[2] G03B *17/04***
**U.S. Cl. 354—193** **3 Claims**



1. A folding photographic camera comprising a camera body having a housing in the front face thereof; a lens supporting member including a first plate portion supported at one end thereof on the camera body for swinging movement about an axis adjacent to a first edge of the housing and a second plate portion connected at one edge thereof to the other end of the first plate portion; and a taking lens supported in an opening provided in the second plate portion, said lens supporting member being swingable about said axis between a folded position in which said first plate portion extends substantially in parallel to the front face of the camera body to close the housing with the other end spaced from a second edge of the housing remote from said first edge thereof and the second plate portion together with the taking lens is housed in the housing, and an expanded position in which said first plate portion projects forward from the front face of the camera body and the second plate portion extends in parallel to the front face of the camera body with the taking lens supported in its photographing position, wherein the improvement comprises an auxiliary closure member which closes the space formed between the other end of the first plate portion and the second edge of the housing when the lens supporting member is in the folded position, said auxiliary closure member being swingable about an axis adjacent to the second edge of the housing and being normally resiliently held in a closing position in which it closes said space so that it is swung inwardly into the housing or outwardly away therefrom pushed by the other edge of the second plate portion when the lens supporting member is moved back and forth between the expanded position and the folded position and returns to the closing position when the other edge of the second plate portion clears the free edge thereof.

---

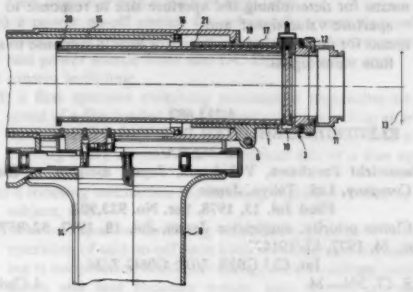
**4,213,686**

## CLOSEUP FOCUSING MECHANISM FOR AN OBJECTIVE OF LONG FOCAL LENGTH

**Ferdinand Kellner, Spittelmüllerstr. 6, 8940 Memmingen, Fed. Rep. of Germany**

**Filed Jul. 12, 1979, Ser. No. 57,077**
**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 2832522**
**Int. Cl.[2] G03B *17/00, 13/02***
**U.S. Cl. 354—195** **4 Claims**

1. A closeup focusing mechanism for a long-focal-length objective comprising an objective housing, means for mounting the objective to a camera, a tube between the objective housing and the camera mounting means, the tube being slidable into and out of the objective housing, a guide rod attached to the camera mounting means and extending towards the



objective housing externally of the tube, and a guide for said rod on the objective housing.

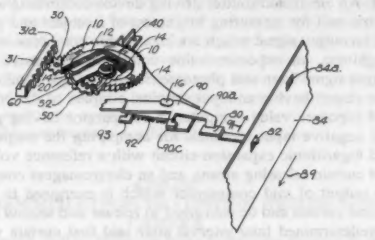
---

**4,213,687**

## FILM ADVANCING MECHANISM

**Russell E. Hattis, Highland Park, Ill., and Chan K. Yan, Hong Kong, Hong Kong, assignors to W. Haking Enterprises Limited, Hong Kong**

**Filed Jul. 10, 1978, Ser. No. 923,373**
**Int. Cl.[2] G03B *1/00***
**U.S. Cl. 354—213** **8 Claims**



1. In a camera which includes means for receiving film with metering perforations therein spaced one frame distance apart, and rotatable film winding means for imparting movement to said film and rotatable in a film winding direction unless locked against rotation in such direction, said camera further including a film perforation sensing member movably urged toward the path of movement of the film metering perforations of said film, a manually operable means mounted on the camera for movement in a film winding direction and locking means responsive to the entry of said sensing member into a film perforation for locking said film winding means for movement in said film winding direction, the improvement comprising: film advancing and slip clutch mechanism on said camera and coupled between said manually operable means and said film winding means, said film advancing and slip clutch mechanism comprising first rotatable means rotated respectively in at least a first direction when said manually operable means is operated in one direction, said film winding means being an annular gear means rotatable in a film winding direction and having internal teeth and a portion thereof to be coupled to said film, eccentrically mounted gear means pivoted upon and carried by said first rotatable means at a point spaced from the axis of rotation of said annular gear means and engaging said internal teeth of said annular gear means, sun gear means meshing with said eccentrically mounted gear means, said eccentrically mounted gear means when said first rotatable gear means is driven being rotated in non-driving relationship to the internal teeth of said film winding gear means when said sun gear means rotates and

being rotated in driving relationship therewith to effect a film winding operation when said sun gear means is held against rotation, and slip clutch-forming means including rotatable means secured to said sun gear means and rotation inhibiting means engaging the latter rotatable means, said inhibiting means being responsive to the unhindered rotation of said film winding means by holding said latter rotatable means and the sun gear means connected thereto stationary and responsive to the positive locking of said film winding means by either said locking means or the inability of the film to be advanced any further by permitting said latter rotatable means to slip by said rotation inhibiting means.

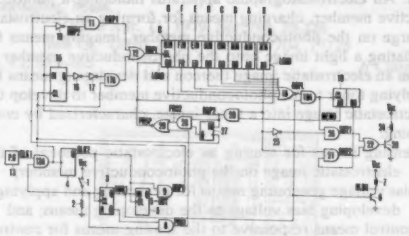
---

**4,213,688**

## AUTOMATIC EXPOSURE TIME CONTROL APPARATUS FOR CAMERA

**Kazukichi Mikajiri, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 9, 1979, Ser. No. 19,110**
**Claims priority, application Japan, Mar. 16, 1978, 53-30144**
**Int. Cl.[2] G03B *7/00*; H03K *21/36***
**U.S. Cl. 354—23 D** **16 Claims**



1. An automatic exposure time control apparatus for a camera, wherein the exposure time has an integral part and a decimal part, comprising:

(a) first pulse generating means for producing a first train of pulses having a certain determined frequency;

(b) second pulse generating means for producing a second train of pulses having a certain determined frequency relative to the content of the decimal part of the exposure time;

(c) pulse counting means for counting pulses;

(d) means for supplying the first pulse train to the pulse counting means and the second pulse train to the pulse counting means at a subsequent time interval;

(e) means for initiating counting of pulses from the first pulse train by the pulse counting means when the exposure is initiated; and

(f) control means for terminating the exposure when the pulse counting means has counted $2^n$ pulses relative to the content of the integral part of the exposure time coming from the first pulse generating means and $2^n \cdot b$ pulses relative to the content of the decimal part of the exposure time coming from the second pulse generating means at the subsequent time interval.

---

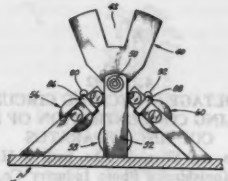
**4,213,689**

## ELECTROMAGNETICALLY ACTUATED SHUTTER MECHANISM FOR CAMERAS

**Roy A. Clapp, 10522 Foley Blvd., Minneapolis, Minn. 55433**

**Filed Mar. 22, 1979, Ser. No. 22,693**
**Int. Cl.[2] G03B *9/10***
**U.S. Cl. 354—234** **9 Claims**

1. In a camera having an optical axis and film, a shutter blade, means mounting said blade for pivotal movement intermediate the ends of said blade, said blade having an opening nearer one end thereof, permanent magnet means carried by said blade nearer the other end thereof, first, second and third electromagnet means cooperable with said permanent magnet means, and means for energizing said several electromagnet



means to pivot said blade in and out of alignment with said optical axis.

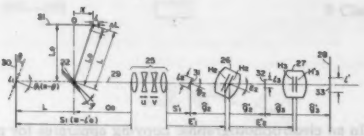
---

**4,213,690**

## COPYING APPARATUS HAVING A HIGH-SPEED COPYING OPTICAL SYSTEM

**Muneharu Sugiura, Tokyo; Setsuo Minami, Kawasaki, and Koichi Miyamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 23, 1979, Ser. No. 32,642**
**Claims priority, application Japan, Apr. 28, 1978, 53-51855**
**Int. Cl.[2] G03B *27/48*, *27/50*, *27/70***
**U.S. Cl. 355—8** **12 Claims**



1. A copying apparatus having a high-speed copying optical system, comprising:

fixed supporting means for supporting thereon an original to be copied;

rotatable deflecting means for scanning said original;

a photosensitive medium for receiving a light flux deflected by said rotatable deflecting means; and

an image forming optical system disposed between said rotatable deflecting means and said photosensitive medium for imaging the light flux from said original on said photosensitive medium, said system having a first optical element having means for correcting the state of the surface of said original being inclined with respect to the optic axis of said image forming optical system as the result of operation of said rotatable deflecting means, and a second optical element having means for correcting, while maintaining a predetermined image forming magnification, the variation in length of the light path between said original surface and said photosensitive medium resulting from the operation of said rotatable deflecting means.

**4,213,691**

**Patent Not Issued For This Number**

---

**4,213,692**

## BIAS VOLTAGE SWITCHING CIRCUIT FOR CONTROLLING CONCENTRATION OF IMAGE IN COPYING APPARATUS

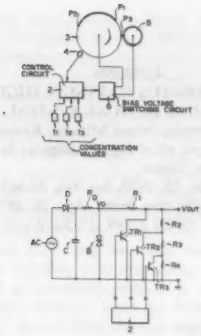
**Mistuo Akiyama, and Shunichi Abe, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Jan. 5, 1979, Ser. No. 1,055**

**Claims priority, application Japan, Jan. 17, 1978, 53-2759**

**Int. Cl.² G03G *15/00***

**U.S. Cl. 355—14 D** **1 Claim**




1. In an electrophotographic copying apparatus for providing a produced image and which includes a photosensitive medium on which an electrostatic latent image of an original is produced and a developing electrode for developing the latent image in the form of a toner image, and in which a bias voltage applied between the photosensitive medium and the developing electrode is varied in response to a control circuit switching signal representing a preselected concentration value to be obtained in the reproduced image, the improvement comprising a bias voltage switching circuit for controlling the concentration of the reproduced image comprising:

a series connection of resistors corresponding in number to a predetermined number of switching steps of the bias voltage;

a constant bias voltage source in parallel connection with said series connection of resistors; and

a plurality of switching transistors each connected between a different junction of the series connected resistors and a common reference potential to which said constant voltage bias source and one end of said series connection of resistors are connected,

said plural switching transistors being turned on selectively in reponse to the control circuit switching signal so as to selectively vary the voltage output of said bias voltage switching circuit and thereby control the concentration of the reproduced image.

**4,213,693**

## ELECTROSTATOGRAPHIC APPARATUS COMPRISING IMPROVED DEVELOPING BIAS CONTROL

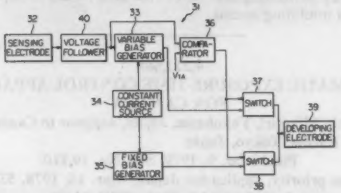
**Chikara Imai; Susumu Tatsumi, and Tadahiro Eda, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jan. 23, 1979, Ser. No. 5,714**

**Claims priority, application Japan, Jan. 25, 1978, 53-6801**

**Int. Cl.² G03G *15/00***

**U.S. Cl. 355—14 D** **9 Claims**




1. An electrostatographic apparatus including a photoconductive member, charging means for forming an electrostatic charge on the photoconductive member, imaging means for radiating a light image onto the photoconductive member to form an electrostatic image thereon and developing means for applying toner to the photoconductive member to develop the electrostatic image into a toner image, characterized by comprising:

sensing means for sensing an electrostatic potential of the electrostatic image on the photoconductive member;

bias voltage generating means for generating and applying a developing bias voltage to the developing means; and

control means responsive to the sensing means for controlling the generating means in such a manner as to increase the bias voltage in accordance with the electrostatic potential until the electrostatic potential reaches a predetermined value and to decrease the bias voltage when the electrostatic potential exceeds said predetermined value.

---

**4,213,694**

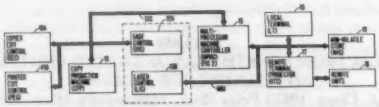
## COPY PRODUCTION MACHINES

**Roger E. Kuseski, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 768,651, Feb. 14, 1977, which is a continuation-in-part of Ser. No. 729,534, Oct. 4, 1976, abandoned. This application May 31, 1977, Ser. No. 802,095**

**Int. Cl.² G03B *27/32*; G03G *15/00***

**U.S. Cl. 355—26** **21 Claims**



1. The method of operating a copy production machine adapted to produce copies in response to received image sets of image-indicating signals for producing a predetermined number of copy sets on a plurality of copy sheets;

the steps of:

(1) receiving and storing in a memory one image set of image-indicating signals;
(2) producing one image on a first side of a copy sheet based on said one image set of image-indicating signals;
(3) receiving and storing in a memory a second image set of image-indicating signals;
(4) producing one image on a second side of a copy sheet based upon said second set of image-indicating signals;
(5) supplying said imaged copy sheet to an output receptacle as a completed copy sheet;
(6) repeating steps (1–5) until all image sets of image-indicating signals have been received and stored and one collated copy set of completed copies has been supplied to said output receptacle; and
(7) fetching said stored image sets of image-indicating signals from said memory for printing all remaining collated copy sets to be printed up to said predetermined number of collated copy sets.

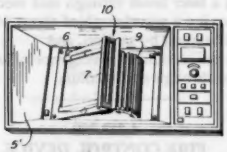
---

**4,213,695**

## INSTANT FILM COLOR BACK ADAPTOR FOR A CAMERA-PROCESSOR

**Richard R. Ely, Fairport, N.Y., assignor to Itek Corporation, Lexington, Mass.**

**Filed Apr. 11, 1979, Ser. No. 29,228**
**Int. Cl.³ G03B** *13/28, 17/44, 17/04, 17/26*
**U.S. Cl. 355—45** **6 Claims**




1. In a camera-processor having a copyboard (1), the image of which is focused upon a first and second imaging plane, the first imaging plane (4) having means for exposing non-instant film, the second imaging plane (5) positioned to facilitate viewing of the image of an object upon said copyboard, and including light shield means ($5^1$) positioned about said second imaging plane, the improvement comprising:
a. a camera back means (10);
b. a film holder (8) for containing instant film;
c. means (11-13) for receiving and positioning said film holder within said camera back means;
d. means (17) for pivotably mounting said camera back along one side of said second imaging plane; and
e. a light tight bellows (9) having one terminal portion thereof coupled to said camera-processor about said second imaging plane and having a second terminal portion coupled to said camera back means so that said camera back means may be pivotably displaced from said second imaging plane for loading and unloading film therein in daylight.

---

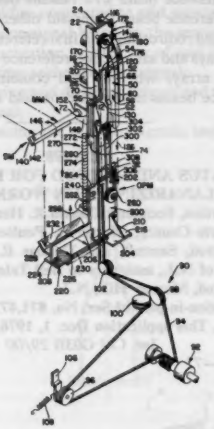
**4,213,696**

## SCAN MECHANISM FOR A MICROFILM READER/PRINTER

**David S. Wise, Solon, Ohio, assignor to Western Reserve Electronics, Inc., Twinsburg, Ohio**

**Filed May 4, 1979, Ser. No. 35,531**
**Int. Cl.² G03G** *15/30;* **G03B** *27/32, 27/70*
**U.S. Cl. 355—45** **9 Claims**

1. A mechanism for coupling a stationary image of a microfilm reader to a rotating drum of a printer comprising:
a scanning mirror located to intercept an image formed by a projection lens of a microfilm reader and having means for moving said scanning mirror across such image, said scanning mirror reflecting an image onto a rotating drum for printing such image; and
mirror rotating means connected to said scanning mirror rotating said scanning mirror as said mirror moves across




an image formed by a projection lens, said mirror rotating means maintaining said mirror oriented in an intercepted image to that an image reflected by said scanning mirror is always at right angles to the intercepted image.

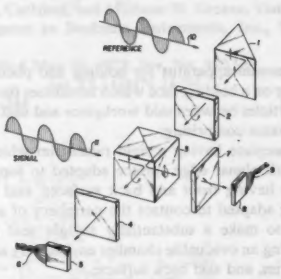
---

**4,213,697**

## PHASE MEASURING DEVICE

**James S. Shreve, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Nov. 6, 1978, Ser. No. 957,779**
**Int. Cl.² G01B** *9/02*
**U.S. Cl. 356—351** **9 Claims**




1. A method of simultaneously providing the combination of a signal beam and a reference beam on a pair of photodetector arrays, the reference beam on one array being $\pi/2$ radians out of phase with the reference beam on the other array, from which the amplitude and phase of the signal beam at various points on the array can be determined, comprising the steps of:
providing a plane polarized signal beam,
providing a plane polarized reference beam which is coherent with said signal beam,
providing a pair of photodetector arrays,
directing a portion of said plane polarized signal beam onto each of said photodetector arrays,
converting said plane polarized reference beam to a pair of

circularly polarized beams which are circularly polarized in opposite directions,

deriving a first plane polarized reference beam from one of said circularly polarized beams and a second plane polarized reference beam $\pi/2$ radians out of phase with said first reference beam from said other circularly polarized beam, and redirecting said first reference beam onto one of said arrays and said second reference beam onto the other of said arrays whereby said combination of signal and reference beams is provided on said arrays.

---

**4,213,698**

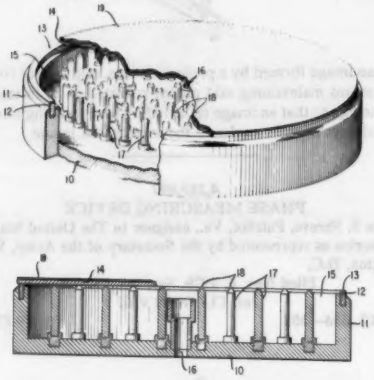
## APPARATUS AND METHOD FOR HOLDING AND PLANARIZING THIN WORKPIECES

**Victor A. Firtion, Secaucus; Donald R. Herriott, Morris Township, Morris County; Martin E. Poulsen, New Providence; Leif Rongved, Summit, and Thomas E. Saunders, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of Ser. No. 871,477, Jan. 23, 1978, abandoned. This application Dec. 1, 1978, Ser. No. 965,304**

**Int. Cl.² G03B *29/00***

**U.S. Cl. 355—77** **6 Claims**



1. A vacuum apparatus for holding and planarizing a thin workpiece on a holding face which minimizes the interposition of dirt particles between said workpiece and said holding face, said apparatus comprising:

(a) a baseplate having a rigid raised rim which includes a smooth planar edge surface adapted to support a workpiece having front and back surfaces, said edge surface being adapted to contact the periphery of said back surface to make a substantially airtight seal thereto, thus forming an evacuable chamber enclosed by said baseplate, said rim, and said back surface;

(b) a plurality of regularly spaced-apart rigid support members disposed within said chamber, each providing a localized pinpoint abutment with said back surface, said abutments together with said edge surface forming a holding face which is substantially planar, each of said abutments having an area sufficiently small to reduce the probability of dirt particles collecting thereon, evacuation of said chamber producing a pressure difference between said front and back workpiece surfaces forcing said back surface to conform to said holding face, the spacing between adjacent ones of said abutments and the spacing between said abutments nearest said rim and said edge surface being sufficiently small to prevent significant distortion of the unsupported regions of said workpiece.

---

**4,213,699**

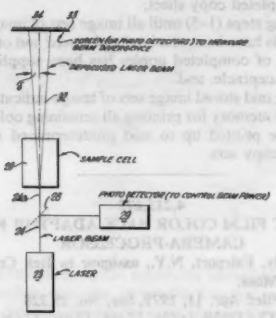
## METHOD OF MEASURING LOW CONCENTRATIONS OF A LIGHT ABSORBING COMPONENT

**Malcolm Moore, St-Denijs Westrem, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium**

**Filed Feb. 27, 1976, Ser. No. 661,917**

**Int. Cl.² G01N *33/28, 21/00***

**U.S. Cl. 356—70** **10 Claims**




1. Method of measuring low concentrations of oil in a transparent medium, comprising

transmitting a laser beam through said medium,

said beam having a wavelength of about 448.0 millimicrons which is absorbed by said oil, and

determining the amount of divergence of said beam created by passage through said medium.

---

**4,213,700**

## FIRE CONTROL DEVICE

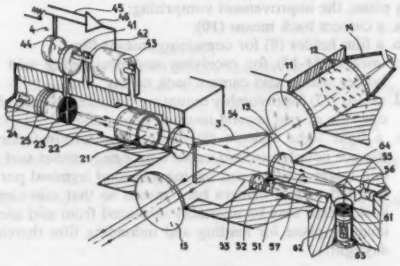
**Michèle Leblanc, Orsay, France, assignor to Societe d'Optique Precision Electronique et Mecanique Sopelem, Paris, France**

**Filed Dec. 19, 1978, Ser. No. 971,903**

**Claims priority, application France, Jan. 6, 1978, 78 00275**

**Int. Cl.² G02B *23/10***

**U.S. Cl. 356—73** **6 Claims**



1. A fire control device for sighting a gun by introducing, between the axis of the gun and the direction of the target, an angular shift based on the trajectory of the ammunition, said device comprising:

fire crosswires;

a sighting telescope for providing an image of said fire crosswires defining a line of collimation;

a range finder of the laser type comprising means for emitting a laser beam, means for receiving said beam after scattering, and means for producing a signal indicating the range;

means for moving said fire crosswires in dependance on said signal from said rangfinder;

a first collimator forming part of said rangefinder and com-

prising an objective, sighting crosswires for sighting said rangefinder, and means for producing an image of said sighting crosswires visible through said telescope for locating the direction of measurement of the range;

a second collimator for shifting said line of collimation comprising an objective and said fire crosswires which are placed at the focal point of said objective;

an optical reflecting element associated with said second collimator for reflecting the image of said fire crosswires into said telescope; and

said first collimator and said second collimator being arranged so that the image of said sighting crosswires passes through said optical reflecting element and is reflected by said fire crosswires towards said optical reflecting element, said fire crosswires being provided with a reflecting face for reflecting said image of said sighted crosswires.

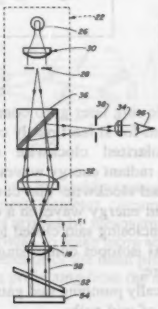
---

**4,213,701**

## LENS TESTING APPARATUS AND METHOD

**J. J. Lanzilloti, 1730 La Granada Dr., Thousand Oaks, Calif. 91360**

**Filed Oct. 30, 1978, Ser. No. 956,465**
**Int. Cl.² G01B *9/00***
**U.S. Cl. 356—124** **25 Claims**



1. A system for testing lenses comprising:

means for forming a first image of a reticle at an image plane location;

means for positioning a reference surface of a test lens at said image plane location;

a mirror located on the side of said test lens opposite said image plane location;

means for adjusting the distance between said image plane location and said reference surface so that a second image of the reticle is formed by light which passes through said test lens, is reflected by said mirror, and which passes back through said test lens;

means for viewing said first and second images;

means for rendering the spectral characteristic of said second image distinguishable from that of said first image;

means for measuring the distance between said image plane location and said reference surface when said second image of the reticle is formed, whereby characteristics of said lens to be tested may be determined.

---

**4,213,702**

## GLASS INSPECTION METHOD AND APPARATUS

**Nelson Bryant, Ithaca, and Rudy Hoppe, Valois, both of N.Y., assignors to Powers Manufacturing, Inc, Elmira, N.Y.**

**Filed Oct. 2, 1978, Ser. No. 948,180**
**Int. Cl.² G01N *21/32***
**U.S. Cl. 356—239** **5 Claims**

1. Apparatus for detecting a flaw in a glass bottle, comprising:

means for directing a light beam at a region of said bottle;

means for rotating said bottle with respect to said beam to cause said beam to scan said region of said bottle;

at least two spaced apart sensors disposed to sequentially detect a fluctuation in said light beam as the light beam emerges from said region of said bottle;

a difference amplifier connected to said sensors for generating a difference signal based on the sequential detection of said fluctuation in intensity of said light beam;

means for inverting said difference signal;

means for rectifying said difference signal and the inverted difference signal;

means for combining the rectified signals; and

a comparator for detecting whether the combined signal exceeds a predetermined threshold value;

whereby the passage of a flaw through said beam within a predetermined time interval causes the combining means to generate a combined signal which exceeds said predetermined threshold value, said predetermined time interval being substantially equal to the time taken for the leading edge of a shadow cast by said flaw as said flaw passes through said beam to intercept one of said sensors after having intercepted the other of said sensors.

---

**4,213,703**

## PHOTOMETER WITH STATIONARY SAMPLE HOLDER AND ROTATABLE SHUTTER

**Otto Haunold, Carlsbad, and Malbone W. Greene, Vista, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed May 30, 1978, Ser. No. 910,819**
**Int. Cl.² G01N *21/01***
**U.S. Cl. 356—244** **10 Claims**

1. A sample holder and shutter assembly for use in instru-

ments mounting a photosensitive device for the determination of light, said assembly comprising:

a stationary body having a sample chamber, and a light path opening from said sample chamber to the photosensitive device;

means for mounting said stationary body in relation to the photosensitive device for the detection of light transmitted from said sample chamber;

shutter means comprising an opaque housing containing the photosensitive device and shielding the photosensitive device from light transmitted from said sample chamber when in the closed position, said housing having an aperture for communication between said photosensitive device and said light path from said sample chamber when said shutter means is in an open position to expose the photosensitive device to light transmitted therefrom;

heat exchange means for controlling the temperature in said sample chamber; and

means for closing said sample chamber to external stray light when said shutter means is in the open position.

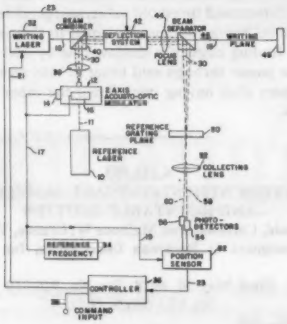
---

**4,213,704**

## METHOD AND APPARATUS FOR SENSING THE POSITION OF A WRITING LASER BEAM

**Richard H. Burns, Glendale, and Kenneth Crabtree, Saugus, both of Calif., assignors to The Singer Company, Stamford, Conn.**

**Filed Dec. 19, 1977, Ser. No. 862,247**
**Int. Cl.[2] G01B 9/02**
**U.S. Cl. 356—349** **13 Claims**




1. The method of sensing the positon of a deflected laser beam comprising:

providing a first laser beam the position of which is to be sensed,

diffracting a second laser beam into at least two beams of unlike frequency by means of a single input frequency,

combining said first laser beam and said laser beams of unlike frequency,

simultaneously passing said combined laser beams through a deflection system to deflect said combined laser beams,

separating said deflected laser beams of unlike frequency from said deflected first laser beam,

focusing said separated laser beams of unlike frequency onto a diffraction grating to produce a traveling interference pattern thereon whereby a plurality of diffracted beams emanate from said grating, and

sensing the frequency of at least one of said diffracted beams emanating from said grating to enable the movement of said first laser beam in a first direction to be determined, and

sensing the frequency of another one of said diffracted beams emanating from said grating to enable the movement of said first laser beam in a second direction perpendicular to said first direction to be determined.

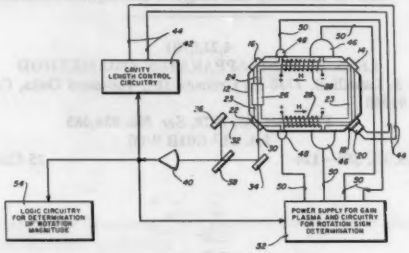
---

**4,213,705**

## FOUR MODE ZEEMAN LASER GYROSCOPE WITH MINIMUM HOLE BURNING COMPETITION

**Virgil E. Sanders, Newberry Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.**

**Continuation-in-part of Ser. No. 798,240, May 18, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,237**
**Int. Cl.[2] G01B 9/02; G01P 9/00**
**U.S. Cl. 356—350** **15 Claims**


CAVITY LENGTH CONTROL CIRCUITRY
LOGIC CIRCUITRY FOR DETERMINATION OF ROTATION MAGNITUDE
POWER SUPPLY FOR GAIN PLASMA AND CIRCUITRY FOR ROTATION SIGN DETERMINATION

1. A four mode ring laser gyro comprising:

reflective means for at least partly confining a pair of right-circularly-polarized clockwise and counter-clockwise propagating radiant energy waves and a pair of left-circularly-polarized clockwise- and counter-clockwise- propagating radiant energy waves in a closed loop path;

an enclosure enclosing said closed loop path;

at least two gas isotopes comprising a gain medium within said enclosure;

means for optically pumping said gain medium in at least one gain section of said path;

reciprocally anisotropic dispersion means in said path for separating the frequency of right-circularly-polarized radiant energy waves from the frequency of left-circularly-polarized radiant energy waves by a chosen predetermined value;

means for applying as a function of said predetermined frequency separation a substantially uniform magnetic field in the direction of said path to all of said gain sections, the intensity of said magnetic field in each gain section being at a value to separate the gain curves of each said isotope into two gain curves separated by an amount to minimize hole burning competition for said predetermined frequency separation.

---

**4,213,706**

## BACKGROUND COMPENSATING INTERFEROMETER

**Henry A. Hill, Tucson, Ariz.; John W. Figoski, New Town, Conn., and Paul T. Ballard, Tucson, Ariz., assignors to The University of Arizona Foundation, Tucson, Ariz.**

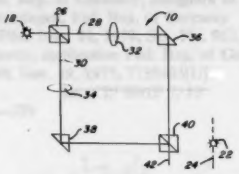
**Filed Aug. 19, 1977, Ser. No. 826,024**
**Int. Cl.[2] G01N 21/46**
**U.S. Cl. 356—353** **18 Claims**

18. A device for reducing the effects of undesired background radiation, comprising:

means for receiving an incident beam containing radiation radiated from a desired object and background radiation and for splitting said incident beam into first and second beams; and

means for introducing a relative shear between said first and

second beams to provide an interference fringe pattern of the background radiation with the radiation from the



desired object being disposed on a dark fringe of the interference pattern.

---

**4,213,707**

## DEVICE FOR IMPROVING THE ACCURACY OF OPTICAL MEASURING APPARATUS AND THE LIKE

John D. Evans, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1979, Ser. No. 33,074
Int. Cl.[2] G01B *11/02, 11/08*
U.S. Cl. 356—387 7 Claims

1. Device for use with and for enabling gauging instruments, which measure the thickness, diameter, circumference or other dimensional parameter of articles by means impinging or scanning the surface of the article, to make more accurate measurements of transparent articles or of the main profile of an article having surface anomalies projecting from the main profile, said device comprising:

a support means; and

flexible means connected to said support means for bearing against and conforming to a portion of the surface of the article to be measured and thereby form a substitute profile on the main profile of the article, said substitute profile suppressing any said surface anomalies and providing a reference surface to be measured by said gauging instruments as representative of the article main profile.

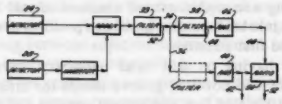
---

**4,213,708**

## GRAININESS SENSOR

John M. Lucas, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 17, 1978, Ser. No. 934,406
Claims priority, application Canada, Jun. 27, 1978, 306279
Int. Cl.[2] G01N *21/30*
U.S. Cl. 356—429 12 Claims



1. An apparatus for determining graininess of a traveling paper web comprising means for moving a paper web relative to a sensing means; said sensing means including means for illuminating an area of less than 1 mm in diameter on said web thereby to instantaneously illuminate a succession of spots on the surface of the moving web as they pass said sensing means and detector means positioned to receive scattered light from said illuminated spots thereby to generate a topographic signal; filter means for filtering said topographic signal to separate a pass frequency range from a blocked frequency range, one of said pass frequency range and said blocked frequency range containing only a selected range of frequencies of said topographic signal; said selected range of frequency representing topographic features of said web of selected lengths in the direction of travel of said web of at least 1.5 mm and that contribute significantly to graininess thereby to provide a first signal having a significant portion of its power determined by surface features that contribute significantly to the graininess of said web; means for averaging said first signal; means for averaging a second signal derived from said topographic signal said second signal including at least a major portion of said blocked frequency range; and means for determining the ratio of said averages thereby to obtain a quantitative indication of the graininess of said web.

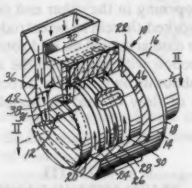
---

**4,213,709**

## ROTARY PROCESSOR

Lefteris N. Valsamis, West Haven, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 1, 1978, Ser. No. 965,387
Int. Cl.[2] B01F *7/02;* B29B *1/06, 3/02*
U.S. Cl. 366—76 11 Claims



1. Apparatus for processing materials which are or in the course of processing become liquid and which comprises a rotatable element carrying at least one primary processing channel and at least one further processing channel with the geometry of the primary channel providing a processing capacity relative to the geometry of the further channel sufficient to transfer material from the primary channel to the further channel at a volume rate at least equal to the rate at which the further channel processes and discharges material and, a stationary element providing a coaxial surface cooperative with the processing channels to provide an enclosed primary processing passage and an enclosed further processing passage; stationary solid members extending into each channel and providing a material collecting end wall for each channel, an inlet through the stationary element for introducing the material into at least the primary processing channel, means adjacent the inlet providing only the primary processing channel with an intake capacity which exceeds the through-put capacity of the primary processing channel, means to transfer material processed in the primary processing channel to the further processing channel at said volume rate and an outlet for discharge of material from the further processing passage; said apparatus also including means to introduce the material to the primary processing channel at a volume rate at least equal to the rate needed to fill the uptake capacity of the primary processing channel, the rotatable element being rotatable in a direction from the inlet toward the outlet to provide a coaction between the rotating side walls of the channels and the material collecting end wall of the channels so that material in contact

with the side walls is dragged forward to the material collecting end wall so that material collected at the end wall of the primary processing passage is transfered to the further processing passage and material collected at the end wall surface of the further processing passage can be discharged from the apparatus.

---

**4,213,710**

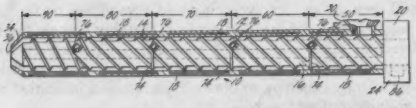
**ADJUSTABLE HOMOGENIZATION EXTRUDER**

**Peter Hold, Milford, Conn.; Zehev Tadmor, Teaneck, N.J., and Hans R. Scharer, Woodbridge, Conn., assignors to USM Corporation, Farmington, Conn.**

**Filed Sep. 26, 1978, Ser. No. 946,093**

**Int. Cl.² B29F *3/02***

**U.S. Cl. 366—81** **8 Claims**



1. An extruder machine for the processing of thermoplastic material comprising:

a body having a bore extending longitudinally therethrough;

a rotor having at least one helically arranged flight disposed therearound, said rotor being rotatively journalled about an axis in said bore;

a feed opening in one end of said body to permit material to be worked to be deposited therein, said feed opening being in communication with said bore;

a discharge opening in the other end of said body to permit material worked therein to be extruded therethrough; and

an adjustable dam arranged on said rotor and movable in the radial direction with respect to the axis of said rotor and rotatable about its own radially directed axis to permit the regulation of flow of said thermoplastic material therewith.

---

**4,213,711**

**FLUID MIXING DEVICES**

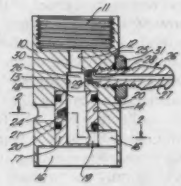
**Thomas G. Bailey, 91, Salisbury Ave., Warden Hill, Cheltenham, England**

**Filed Mar. 30, 1979, Ser. No. 25,602**

**Claims priority, application United Kingdom, Mar. 30, 1978, 12376/78**

**Int. Cl.² B01F *15/02***

**U.S. Cl. 366—150** **9 Claims**



1. A fluid mixing device comprising: a body part; an inlet in the body part for connection to a source of a first fluid under pressure; an outlet from the body part; a main flow passage leading from said inlet to said outlet; means within the main flow passage for creating a low pressure zone in that passage during flow of the first fluid therethrough; an auxiliary passage leading to said low pressure zone; means for connecting the auxiliary passage to a source of a second fluid; and adjustable means for selectively reducing the cross-sectional area of said main flow passage, downstream of said low pressure zone, to an extent whereby, in use of the device, the low pressure zone is ineffective in drawing the second fluid into the main flow passage.

---

**4,213,712**

**METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF A SLURRY EXPLOSIVE CONTAINING AN EMULSIFIED LIQUID COMPONENT**

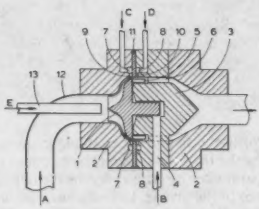
**Bent Aanonsen; Paul-Johny Odberg, both of Saetre, and Eirik Samuelsen, Lierbyen, all of Norway, assignors to Dyno Industries A.S., Oslo, Norway**

**Filed Apr. 4, 1978, Ser. No. 893,309**

**Claims priority, application Norway, Apr. 4, 1977, 771201; Mar. 13, 1978, 780885**

**Int. Cl.² B01F *7/08***

**U.S. Cl. 366—178** **18 Claims**



1. A system for continuously producing an explosive in the form of an emulsion of at least two liquid components which are insoluble in each other by intermixing streams of said components, one of said components comprising an aqueous oxidizing salt solution, and another of said components comprising a combustible liquid, said system comprising:

a housing having an upstream end and a downstream end;

a mixing rotor freely rotatably supported within said housing, said rotor having an outer periphery facing an inner periphery of said housing and defining therewith an annular space;

said rotor including vanes facing said upstream end of said housing;

first inlet feed means extending into said upstream end of said housing for supplying therein a first stream of a first of said liquid components, and for directing said first stream against said vanes and past and around said rotor through said annular space toward said downstream end of said housing, thereby rotating said rotor;

second inlet feed means, extending into said housing between said upstream and downstream ends thereof, for supplying a second stream of a second of said liquid components into said annular space at a position to thereat join with said first stream;

said rotor having on said outer periphery thereof, downstream of said position, groove means for creating turbulence within said first and second streams and for thereby causing said first and second streams to form an emulsion; and

outlet delivery means, extending from said housing at said downstream end thereof, for removing therefrom said emulsion.

4,213,713

## ONE PIECE AGITATOR FOR CLOSED VESSEL

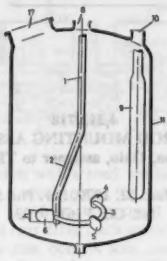
Hugo Kaessner, Schwetzingen, and Wilhelm Loehr, Oftersheim, both of Fed. Rep. of Germany, assignors to Pfaudler Werke A.G., Schwetzingen, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,110

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751770; Nov. 19, 1977, 7735483[U]

Int. Cl.[2] B01F 7/16

U.S. Cl. 366—279 18 Claims



3. In a closed vessel having a manhole opening therein, an agitator opening and an agitator mounted in said agitator opening, said agitator comprising an agitator shaft and an impeller having a diameter larger than the largest opening in said vessel, the improvement wherein said impeller comprises a segment of a ring and a plurality of agitator blades mounted on and extending outwardly from said ring segment.

---

4,213,714

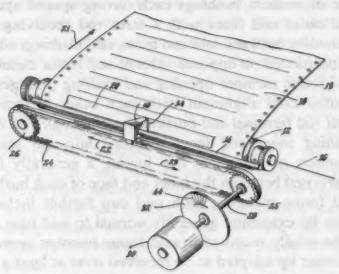
## PRINTER HAVING VARIABLE CHARACTER DENSITY

Clifford M. Jones, and William A. Surber, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Nov. 1, 1977, Ser. No. 847,585

Int. Cl.[2] B41J 3/12, 19/32

U.S. Cl. 400—124 12 Claims



1. In a matrix printer for reproducing characters of selectively different character widths, said printer comprising head means which is transported in a lateral direction parallel to a platen, said head means adapted to form a matrix column of component character marks for forming a character on a record medium, a desired width of a character being determined by the spacing between adjacent matrix columns in a character matrix, the improvement comprising:

first means for generating a single set of electrical, incremental position signals representative of predetermined possible print positions which are all spaced apart an equal distance along said platen and for locating matrix columns at selected ones of said predetermined possible print positions,

second means coupled to said first means for electronically changing the predetermined print positions at which matrix columns are located, and

means for causing the distance between such selected adjacent print positions to always be a predetermined integral submultiple of the character width.

---

4,213,715

## INK RIBBON CARTRIDGE HAVING A REPLACEABLE RIBBON MAGAZINE

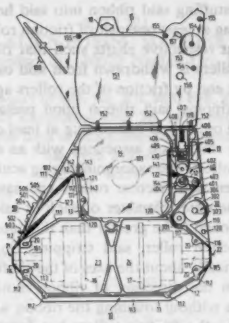
Johannes Haftmann, Borchen-Doerenhagen, and Rudolf Schmeykal, Neuenbeken, both of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,591

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717076

Int. Cl.[3] B41J 33/10

U.S. Cl. 400—196.1 16 Claims



1. An ink ribbon storage and guide device constructed for use in combination with but selectively independently removable from a printer and comprising:

a body defining a contoured interior storage compartment and an elongated ink ribbon guide path around at least a portion of the perimeter of said body,

inlet and outlet means in said body and disposed at respective spaced points adjacent said storage compartment,

said ribbon guide path being substantially completely internal of said body but exiting from said body in at least one perimeter location for association with a printer head,

said body further defining an open interior volume adjacent said location for occupation by a printer head when said body is operatively installed in a printer,

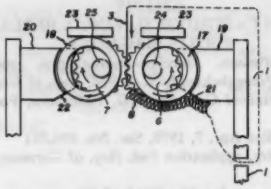
drive roller means mounted on the body adjacent said inlet means for causing an ink ribbon to be driven from said outlet means to said inlet means by way of the guide path; and

an ink ribbon magazine having substantially the same dimensions and contours of said contoured storage compartment and being independently removably disposable within said storage compartment, said magazine having an outlet opening which is adjacent said outlet means and an inlet opening adjacent said inlet means when said magazine is disposed within said storage compartment, said ink ribbon magazine comprising a closed plastic container having permanently disposed therein an endless ink ribbon loop an interchangeable portion of which is extensible from said magazine for location with said guide path when said magazine is located in said storage compartment for use in printing operations and being wholly removable from said body and said drive roller means independent of the removal of said body from said printer.

## 4,213,716
## RIBBON STRIPPING MECHANISM

Andrew B. Carson, Jr., Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Filed May 15, 1978, Ser. No. 906,112
Int. Cl.[2] B41J 33/10
U.S. Cl. 400—196.1 8 Claims



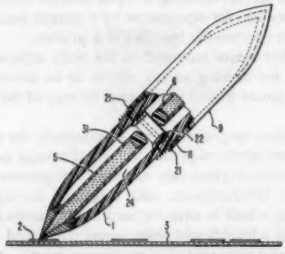
1. Means for withdrawing ribbon from an outlet end of a housing and stuffing said ribbon into said housing at an inlet end comprising at least one pair of friction rollers mounted for rotation about respective shafts such that ribbon passing between said rollers is withdrawn from said outlet end and fed into said inlet end by friction of the rollers against the ribbon, means for stripping said ribbon upon passage through said rollers to said outlet end comprising at least one pair of rotatable stripping rings each associated with an associated one of said friction rollers, means for minimizing scuffing and rubbing forces between said friction rollers and said stuffed ribbon comprising the outer diameter of each of said stripping rings being dimensioned to be greater than the outer diameter of its associated friction roller, said stripping rings supported to rotate eccentrically about the axes of the shafts of their associated rollers in the direction of ribbon motion through the friction rollers without touching the ribbon where said ribbon passes between the friction rollers but frictionally engaging said ribbon after said ribbon leaves said rollers.

---

## 4,213,717
## BALL POINT PEN, INK AND ITS ERADICATOR SYSTEM

An-Chung R. Lin, Fairport, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 784,653, Apr. 4, 1977, Pat. No. 4,156,657.
This application Nov. 13, 1978, Ser. No. 960,256
Int. Cl.[3] B43K 27/12, 7/00
U.S. Cl. 401—18 7 Claims



1. A pen for an ink-eradicator system having an ink and its eradicator, wherein said colored ink of said system, which can be eradicated after application, comprises:

a dye which remains colored in acid solution,

a vehicle solution in which the dye will dissolve, and

an acid with a PKa value smaller than 7, and wherein said eradicator for said ink comprises

an amount of a base effective to neutralize the acid of said ink,

an amount of an amine effective to act as a decolorizing agent for the dye to form a colorless product, and

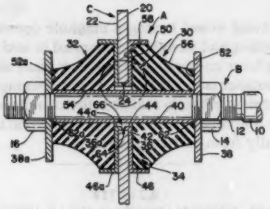
a hydroxy solvent, said pen containing at least one of said ink or its eradicator in solution.

---

## 4,213,718
## STRUT ROD MOUNTING ASSEMBLY

Dale Lumby, Hudson, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 22, 1979, Ser. No. 51,279
Int. Cl.[2] F16B 9/02
U.S. Cl. 403—197 9 Claims



1. A mounting assembly for connecting a terminal end portion of an elongated strut rod to a vehicle frame member at a predetermined mounting opening passing therethrough, said mounting assembly comprising:

a pair of resilient bushings each having spaced apart inner and outer end faces with a strut rod receiving passage extending between said end faces, said bushings adapted to be positioned on opposite sides of said frame member with said frame member opening and bushing passages in substantial axial alignment with each other to receive said strut rod terminal end portion therethrough and with said bushing inner end faces disposed adjacent said frame member; an alignment cup having a generally flat base interposed between the inner end face of each bushing and said frame member, each said cup further including an inner lip extending generally normal to said base adapted to be axially received in said frame member opening and an outer lip adapted to be received over at least a portion of the outer periphery of the associated bushing inner end face, said outer lip being spaced along said base from said inner lip and extending outwardly therefrom in a direction generally opposite to said inner lip; spacer means adapted to prevent the side walls of said bushing passages from contacting said strut rod along said terminal end portion thereof; and, a thrust member disposed at each bushing outer end face wherein said thrust members are adapted to be brought into bearing engagement against said bushing body outer end faces by selectively adjustable force means received at spaced apart locations along said strut rod terminal end portion, whereby said inner lips are adapted to center and pilot said alignment cups in said frame member opening and said outer lips are adapted to pilot said bushings at least in response to any rocking movement of said strut rod caused during vehicle operation.

4,213,719

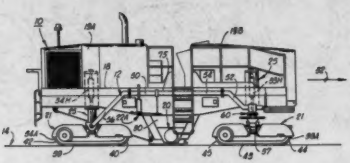
## GRADE AVERAGING APPARATUS

George W. Swisher, Jr., and Thomas L. Steele, both of Oklahoma City, Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 887,004, Mar. 16, 1978, Pat. No. 4,140,420. This application Sep. 28, 1978, Ser. No. 946,606

Int. Cl.² E01C *19/00*

U.S. Cl. 404—84 12 Claims



12. In combination with a road working machine having a frame supporting a work piece for working contact with a roadway surface, the frame supported by a drive assembly having at least one rear drive track connected to the frame and pivotable about a rear control axis, and the drive assembly having at least one forward steering drive track connected to the frame and pivotable about a forward control axis, the forward steering drive track supported to accommodate swivel rotation to steer the road working machine, and the elevation of the work piece determined by an elevation control device sensing an external elevation control reference, the improvement comprising:

a bar member having a forward end and a rear end, the rear end of the bar member pivotally connected to the rear drive track at a selected attachment point defining a rear elevation reference being constantly fixed relative to the rear control axis, the elevation of the rear elevation reference being indicative of the average grade of the roadway surface supporting the rear drive track; and

bar connecting means supporting the forward end of the bar member and connected to the forward steering drive track for providing a pivot point between the forward end of the bar member and the forward steering drive track such that the pivot point defines a forward elevation reference the position of which is constantly fixed relative to the forward control axis throughout the range of swivel of the forward steering drive track, the elevation of the forward elevation reference being determined by the average grade of the roadway surface supporting the forward steering drive track, and the bar member providing the elevation control reference indicative of the average of the forward elevation reference and the rear elevation reference, the bar connecting means comprising:

a swivel plate assembly supported by the forward steering drive track and having a bearing surface; and

bearing means attached to the forward end of the bar member for engaging the bearing surface of the swivel plate.

---

4,213,720

## TENSIONING OF MEMBERS

Michael L. Portass, Barrow-in-Furness, England, assignor to Vickers Limited, London, England

Filed Sep. 5, 1978, Ser. No. 939,217

Claims priority, application United Kingdom, Sep. 5, 1977, 37050/77

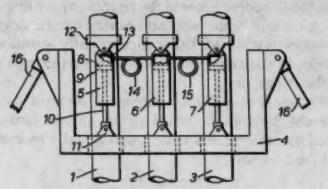
Int. Cl.² E21B *43/01*

U.S. Cl. 405—195 6 Claims

1. In combination, two or more members capable of relative axial movement with respect to one another and an arrangment for applying tension to each of said members, which arrangement comprises:

(i) a frame to which tension is to be applied, and

(ii) a plurality of hydraulic cylinders linking the members to the frame, each member being linked to the frame by a separate cylinder and the cylinders being interconnected hydraulically such that the hydraulic fluid pressures in the



cylinders are in a fixed proportion relative to one another and the members are thereby capable of relative axial movement with respect to one another without change in the proportion of the tension carried by the members.

---

4,213,721

## ALIGN BORING MACHINE

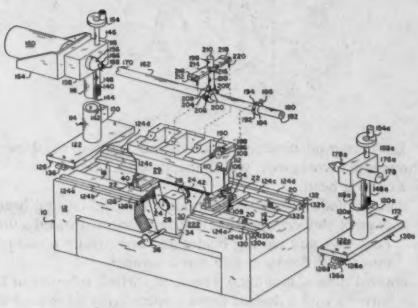
R. Warren Aldridge, Jr., 10022 Nadina Dr., Hunstville, Ala. 35803

Continuation-in-part of Ser. No. 875,985, Feb. 8, 1978, Pat. No. 4,132,494. This application Dec. 26, 1978, Ser. No. 972,975

The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.

Int. Cl.² B23B *41/12*

U.S. Cl. 408—54 8 Claims



1. A boring machine for alignment boring of a plurality of bearing housings of an automotive engine block comprising:

a horizontally elongated base having vertical and horizontal longitudinally extending machine ways;

a first vertically adjustable-in-height support positioned on one end region of said elongated base and engageable and alignable with said machine ways, and a second vertically adjustable-in-height support positioned on an opposite end region of said elongated base and engageable and alignable with said machine ways;

an elongated horizontal track on said base between said supports, which track defines a longitudinal axis and horizontal reference plane in alignment with said vertical and horizontal machine ways;

a table adapted to be supported by and be longitudinally movable along said track,

feed means for selectively moving said table along said track;

a boring bar;

bearing support means for horizontally and rotably supporting ends of said boring bar on and between said first and second supports and along a line in a first plane parallel with the plane of said vertical machine ways and coinci-

dent in a second plane parallel with the plane of said horizontal machine ways;

drive means coupled to one end of said boring bar for rotating said boring bar;

engine block support means for rigidly supporting an engine block on said table with said boring bar through bearing housings with said bar concentrically positioned with respect to the center of a desired bore through said bearing housings; and

at least one cutting tool mounted on said boring bar, whereby bearing housings of an engine block may be bored by moving said table longitudinally by operation of said feed means.

---

## 4,213,722
## TRANSPORTABLE EXTERNAL THREAD CUTTING MACHINE

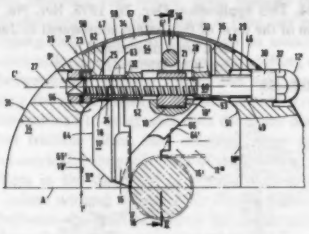
**Rudolf Wagner, Stuttgart, Fed. Rep. of Germany, assignor to Rems-Werk Christian Föll und Söhne GmbH & Co., Waiblingen, Fed. Rep. of Germany**

**Filed Dec. 26, 1978, Ser. No. 972,781**

**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758284; Nov. 3, 1978, 2847784**

**Int. Cl.² B23B *39/00***

**U.S. Cl. 408—73** **14 Claims**



1. A transportable external thread cutting machine for threading a workpiece, which machine includes:

a cutting head;

cutting blades displaceably mounted in said cutting head;

a control device operatively connected with said cutting head and said cutting blades and comprising a one-piece unit which forms a slide and a scanner;

control means, including a control surface selected in conformity with a desired thread, operatively associated with said one-piece unit for moving same relative to said workpiece in response to contact between said scanner and said control means.

---

## 4,213,723
## THREAD CUTTING DIE STOCK

**Rudolf Wagner, Waiblingen, Fed. Rep. of Germany, assignor to Rems-Werk Christian Föll und Söhne GmbH & Co., Waiblingen, Fed. Rep. of Germany**

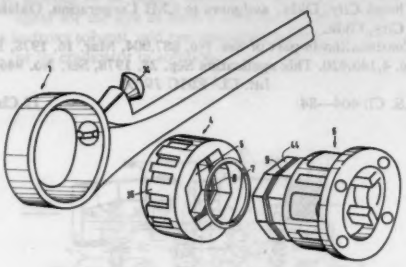
**Filed Jan. 9, 1978, Ser. No. 867,765**

**Claims priority, application Fed. Rep. of Germany, Jan. 7, 1977, 2700465**

**Int. Cl.² B23B *45/12;* B23G *1/30***

**U.S. Cl. 408—239 A** **4 Claims**

1. A thread cutting die stock which includes in combination: a die stock head structure having an axis, an abutment surface, and a bore with a first inner guiding surface for detachably receiving one of a first cutting head or an adaptor which has a second bore with an annular groove about the inner wall thereof, and a resilient fastener means in said groove, a securing means engaging one of said first cutting head or said adaptor and said abutment for securing same to said head, a second cutting head for mounting in said second bore and having securing means for engagement with said resilient fastener means in said annular groove, whereby either said first cutting head is secured in said die stock head or said second cutting



head is secured in said die stock head by mounting said second cutting head in said adaptor secured in said die stock head.

---

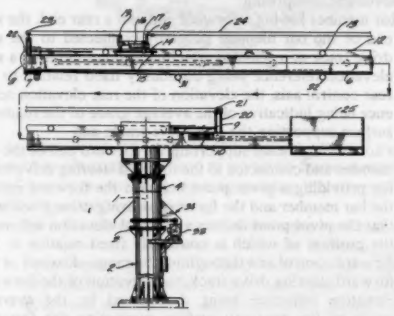
## 4,213,724
## CONVEYOR APPARATUS FOR STACKING AND DISTRIBUTING COMMINUTED MATERIAL

**Eugene R. Holderness, Claremont, Calif., assignor to Occidental Research Corporation, La Verne, Calif.**

**Filed Dec. 30, 1977, Ser. No. 866,047**

**Int. Cl.² B65G *65/28***

**U.S. Cl. 414—133** **12 Claims**



1. A conveyor apparatus for stacking and distributing comminuted material comprising:

(a) a fixed first support;

(b) a second support supported by the first support and capable of rotation about a vertically extending rotational axis through such second support;

(c) an arm secured intermediate its length to the second support, said arm concomitantly rotatable with said second support about the vertically extending rotational axis intersecting the arm;

(d) a means for rotating the second support and concomitantly therewith the arm about the vertically extending rotational axis;

(e) a first pulley secured to one end of the arm;

(f) a second pulley secured to the arm between the second support and the end of the arm opposite the first pulley;

(g) an endless conveyor belt extending around the first and second pulleys to form a closed loop having an axial path of travel along the arm around such a closed loop;

(h) means positioned along the arm between the first and second pulleys for supporting the conveyor belt;

(i) a means for driving the conveyor belt around the first and second pulleys;

(j) a plow capable of traversing a length of the arm between the first and second pulleys and having a plow blade

positioned above and in close proximity to the surface of the conveyor belt;

(k) a reversible winch secured to the arm in proximity to the second pulley;

(l) a third pulley secured to the arm in proximity to the first pulley;

(m) a cable with one end attached to the plow, extending through and around the third pulley and around the winch with the remaining end of the cable attached also to the plow; and

(n) means for driving the winch.

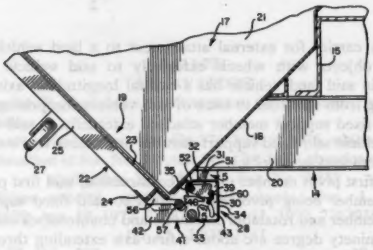
---

**4,213,725**

## DOUBLE LOCKING DOOR LATCH MECHANISM FOR RAILWAY HOPPER CARS

**Willis H. Knippel, Palos Park, Ill., assignor to Pullman Incorporated, Chicago, Ill.**

**Filed Oct. 25, 1978, Ser. No. 954,791**
**Int. Cl.² B61D *7/30*; B65G *67/24***
**U.S. Cl. 414—387** **10 Claims**



1. A railway hopper car comprising a car body including an underframe,

a hopper structure supported on said underframe including downwardly and outwardly extending slope sheets and a discharge opening,

a door hingedly connected to said car body for movement between open and closed positions relative to said opening,

the improvement of a door lock arrangement comprising;

a lock support bracket connected to said hopper structure adjacent to said discharge opening,

a latch member movably supported on said bracket between open and closed positions,

said latch member having a latch positioning portion and a keeper receiving portion,

a keeper element on said door adapted to engage said keeper receiving portion in the locked position of said door,

first and second stop elements on said latch positioning portion,

a locking element movably connected to said bracket adjacent to said latch positioning portion,

said locking element in a closed position of said latch member having a third stop engaging said first stop element to maintain said latch member closed,

a cam follower element on said locking element,

a reciprocating actuating member supported on said bracket and including a cam engaging said cam follower,

said reciprocating actuating member having a fourth stop in the closed position of said latch member engaging said second stop to maintain said latch member closed, and

means for reciprocating said actuating member whereby said cam follower moves said locking element and first and third stops out of engagement,

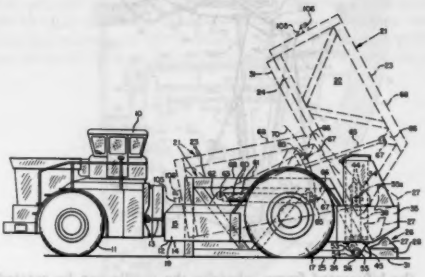
and said fourth stop is disengaged from said second stop, whereupon said latch member is moved to an open position releasing said keeper element.

**4,213,726**

## CONTAINER CARRIER VEHICLE

**James J. Robnett, Happy Valley, Oreg., and Dennis R. Thomas, Mount Hope, Canada, assignors to Raygo Wagner, Inc., Portland, Oreg.**

**Filed Jul. 24, 1978, Ser. No. 927,623**
**Int. Cl.² B60P *1/04***
**U.S. Cl. 414—420** **13 Claims**



1. Apparatus for simultaneously raising and tipping a structure from a first lower position at which the bottom of said structure is substantially horizontal to a second upper position at which one end thereof is more highly elevated than the other end thereof, said structure having a first pivot support point positioned adjacent the bottom of said one end thereof and a second pivot support point disposed forwardly of and vertically above said first pivot support point, comprising:

carriage means engageable with said structure at said first pivot support point and constrained to raise said first pivot support point substantially vertically; and

a support arm pivotally attached at one end to said structure at said second pivot support point, said support arm being pivotally attached at its other end to a fixed point of support, said support arm pivoting and said second pivot support point on said structure rotating upwardly along an arcuate locus about said fixed point of support as said carriage means raises said first pivot support point on said structure, said second pivot support point being raised a distance less than said first pivot support point,

said structure thereby being simultaneously vertically raised and rotated, whereby said one end thereof is more highly elevated than said other end thereof at said second upper position.

---

**4,213,727**

## DRUM HANDLING APPARATUS

**Charles H. Lighthipe, Jr., Pompey, N.Y., assignor to Morse Manufacturing Company, Inc., East Syracuse, N.Y.**

**Filed Dec. 11, 1978, Ser. No. 968,207**
**Int. Cl.² B65G *65/24***
**U.S. Cl. 414—420** **11 Claims**

1. Apparatus for use in a drum lifting and handling mechanism including

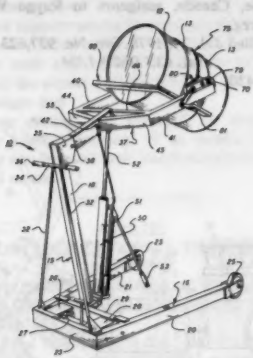
a bifurcated frame,

a saddle having two parallel side rails cojoined by a rear rail, the distance between the two side rails being less than the diameter of a drum to be handled whereby the side rails may be passed axially beneath a horizontally resting drum to arrest the back rail against one end wall of the drum and cradle the cylindrical wall of the drum between the two side rails,

a pair of opposed posts depending upwardly from each side rail,

an adjustable sling affixed to each of the posts for encompassing the upper portion of a drum seated in said saddle, said sling having a locking means associated therewith for tightening the sling against the drum to secure said drum within said saddle,

a pair of axially aligned trunnions depending outwardly from the posts that are rotatably supported in the arms of



the bifurcated frame whereby the saddle can be rotated within said frame.

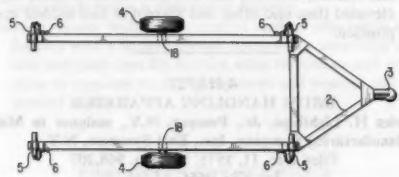
---

**4,213,728**

**CONTAINER LIFTER**

**Geoffrey F. McKenzie, Box No. 271, P.O., Rabaul, Papua New Guinea**

**Continuation-in-part of Ser. No. 626,925, Oct. 29, 1975, abandoned. This application May 4, 1978, Ser. No. 902,856**
**Claims priority, application Australia, Oct. 31, 1974, PB9447**
**Int. Cl.³ B62B** *1/06*
**U.S. Cl. 414—446** **3 Claims**



3. A container lifter for use with bulk handling freight containers of generally rectangular form, said lifter comprising a pair of parallel horizontally disposed frame arms joined by a cross-member to form a U-shaped frame chassis adapted to be arranged around three sides of a container to be lifted; a towing hitch on said cross-member adapted to be secured to a fork-lift truck, a wheel on each of said frame arms centrally disposed along the length thereof, thereby defining a central transverse axis about which the lifter can perform a see-sawing motion; a pair of sliding buffers on each of said frame arms disposed one at each end thereof, first ends of said buffers being engageable with side portions of the container; lengths of chains having first ends connected to the other ends of said buffers, and means connected to the other ends of said chains for engaging the container at a respective one of the four courners of the base thereof.

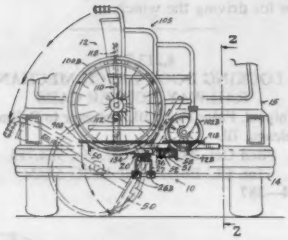
---

**4,213,729**

**VEHICLE ATTACHED CARRIER PIVOTABLE ABOUT PLURAL AXES**

**Clarence W. Cowles, Placentia, Calif.; James C. Breashears, Amarillo, Tex., and Edwin M. Mungons, Toledo, Ohio, assignors to Eugene Wilmoth, Westland, Mich.**

**Filed Jan. 27, 1978, Ser. No. 873,054**
**Int. Cl.² B60R** *9/00*
**U.S. Cl. 414—462** **3 Claims**



1. A carrier for external attachment to a land vehicle to carry objects with wheels externally to said vehicle and wherein said land vehicle has a central longitudinal axis extending from the front to back of said vehicle comprising:

a. a fixed support member attached externally to said land vehicle said fixed support member protruding rearwardly from said land vehicle;

b. a first pivot member of rigid construction, said first pivot member being pivotally mounted to said fixed support member and rotatable clockwise and counterclockwise in a ninety degree arc about a first axis extending through said first pivot member, said rotation being between a vertical storage position and a horizontal carrying position and wherein said first axis is perpendicular to the central longitudinal axis of said land vehicle;

c. a second pivot member of rigid construction, said second pivot member being pivotally mounted to the first pivot member for rotational movement about a second axis through said first pivot member, said second axis being parallel to the central longitudinal axis of said land vehicle;

d. means affixed on said second pivot member for carrying objects, said means comprising metallic bar members formed into a polygonal perimeter configuration, said metallic bar members being open in the center to receive the bottom of one or more wheels of the object to be carried;

e. means on said second pivot member to lock same in a horizontal position relative to said first pivot member and said fixed support member.

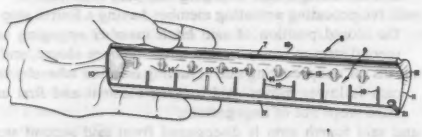
---

**4,213,730**

**DEVICE FOR USE IN COUNTING SMALL ITEMS**

**Nicholas A. Di Gaetano, 450 Merrimac Blvd., Port Orange, Fla. 32019**

**Filed Mar. 7, 1979, Ser. No. 18,231**
**Int. Cl.³ B65B** *67/02;* **G07D** *9/06*
**U.S. Cl. 414—675** **6 Claims**



1. A device to facilitate the counting of small items compris-

ing an elongated trough shaped holder having a closed end and an open discharge end, said holder including a transversely rounded bottom adapted to receive a number of small items to be counted and upwardly diverging side walls, the upper surface of said bottom having means for separating the items into small groups, and one of said side walls having inwardly opening pockets to receive the separated items when the holder is oscillated about its longitudinal axis in a direction to cause the side wall having said pockets to assume a bottommost position, whereby the small number of items contained in each pocket may be readily counted and the contents of all the pockets quickly totaled prior to oscillating the holder in the other direction for returning the items to said bottom and so that the items may be discharged through the open end of the holder when the holder is tilted endwise to cause said open end to assume a lowermost position.

---

**4,213,731**

## EXCAVATORS

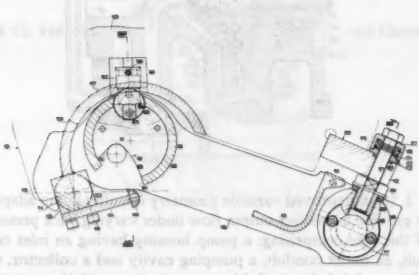
**Antonius P. Verachtert, Julianastraat 14, Kerkdriel, Netherlands**

**Continuation of Ser. No. 656,376, Feb. 9, 1976, which is a continuation of Ser. No. 309,488, Nov. 24, 1972, abandoned. This application Jan. 15, 1979, Ser. No. 3,531**

**Claims priority, application Netherlands, Dec. 1, 1971, 7116489; Apr. 19, 1972, 7205286; Oct. 13, 1972, 7213935**

**Int. Cl.² E02F *3/81***

**U.S. Cl. 414—723** **19 Claims**



**11.** In an excavator apparatus, connecting means for connecting an excavating attachment to an intermediate piece connected to a movable boom of the excavator apparatus, said connecting means comprising:

a cylindrical support on the intermediate piece and provided with means defining a reaction surface;

wall means defining a first recess on the attachment opening away from said reaction surface and a second, arcuate recess on the attachment adjacent said first recess;

a locking element on the intermediate piece slidably engaging said wall means in said first recess;

a reaction fulcrum pivot carried by said attachment and bearing against said reaction surface;

means on said intermediate piece defining a rotation axis rotatably received in said second recess; and

adjustable fastening means carried by said intermediate piece and acting against a portion of the attachment to prestress said fulcrum pivot against said reaction surface and said means defining said rotation axis against said wall means defining said second recess about said rotation axis.

**4,213,732**

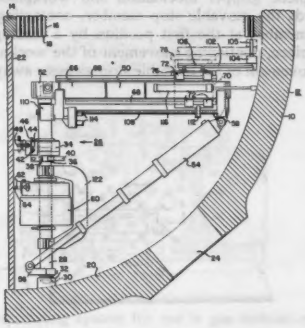
## APPARATUS FOR REMOTELY REPAIRING TUBES IN A STEAM GENERATOR

**Frank W. Cooper, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 13, 1978, Ser. No. 895,831**

**Int. Cl.² B65G *47/90***

**U.S. Cl. 414—728** **10 Claims**



**1.** Apparatus for remotely repairing a tubesheet and tubes accessible from a head of a steam generator which has a centrally disposed partition dividing the head into an inlet and an outlet portion and a manway disposed in each of said portions, said apparatus comprising:

a column rotatably disposed in a portion of said head generally perpendicular to said tubesheet, said column having one end terminating a predetermined distance from said tubesheet;

a boom pivotally mounted adjacent the terminal end of said column;

means for rotating said column and said boom therewith;

means for locking said column and said boom in any rotated position;

means for pivoting said boom from a position generally parallel to said tubesheet to positions generally aligned with each of said manways;

a carriage disposed to ride lengthwise along said boom;

means for moving said carriage lengthwise along said boom and for fixing the position of said carriage on said boom;

said carriage including a base which is generally parallel to the tubesheet when the longitudinal axis of the boom is generally parallel to the tubesheet, a platform generally parallel to the base, a first gear train at least partially supported by the base and connected to the platform for moving said platform relative to said base, means for maintaining a parallel relation between the platform and base, a positioning motor for transmitting power to said first gear train, a tool holder supported by and being selectively cantilevered over said platform, said tool holder including a chuck for grasping tools and a drive motor for driving said chuck, said drive motor being associated with said first gear train and being movable with said platform wherein a plurality of tools operable on the tubes and the tubesheet are graspable by the chuck.

---

**4,213,733**

## AUTOMATIC SIDE GAUGE FOR MACHINE TOOL WORKPIECE CONTROL AND METHOD

**Robert P. De George, Kenmore; Paul R. Brown, Akron, and Victor T. Carbone, West Seneca, all of N.Y., assignors to Houdaille Industries, Inc., Fort Lauderdale, Fla.**

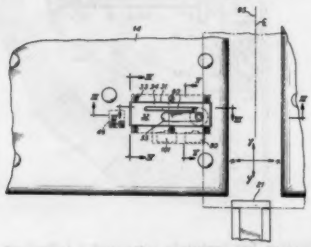
**Filed Sep. 7, 1976, Ser. No. 720,803**

**Int. Cl.² B25J *13/00***

**U.S. Cl. 414—751** **3 Claims**

**1.** The method of setting a workpiece position control for

machine tools which comprises the steps of providing an automatically controlled movable workpiece gripping mechanism, providing a movable stop member movable between a rest position and an end of travel position spaced from the rest position, loading a workpiece onto the workpiece gripping mechanism, projecting a portion of the movable stop member into a path of movement of the workpiece carried by the workpiece gripper mechanism, causing movement of the workpiece gripper mechanism and workpiece in the path towards the movable stop member, contacting the movable stop member at the first position by a leading edge of the workpiece, continuing movement of the workpiece and causing movement of the movable stop member away from the rest



position to a first position spaced from the rest position in the direction of movement of the workpiece, sensing the presence of the movable stop at the first position and setting a base line reference within an automatic control for the workpiece gripping mechanism in dependent response to the sensing of the presence of the movable stop member at the first position, including the additional steps of providing a first carriage stop movement signal to the automatic control upon sensing the presence of the stop at the first position, sensing failure of the carriage to stop at the first position as a result of the first stop signal by sensing the presence of the stop at a second position closely spaced from the first position, providing a second carriage stop movement signal to the automatic control upon sensing the presence of the stop at the second position.

---

**4,213,734**

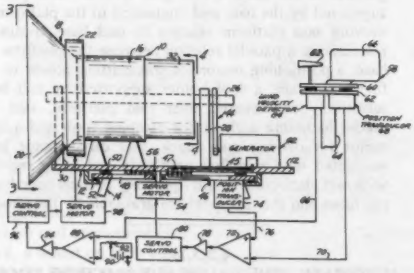
**TURBINE POWER GENERATOR**

**Jerry W. Lagg, 15246 Collingham, Detroit, Mich. 48205**

**Filed Jul. 20, 1978, Ser. No. 926,254**

**Int. Cl.[2] F03D** *7/04, 1/04*

**U.S. Cl. 415—4** **12 Claims**



1. A reaction-type turbine rotatable by fluid flow longitudinally therethrough, said turbine comprising a rotatable output shaft, a rotatable tubular shroud disposed concentric to said output shaft, means rigidly interconnecting said output shaft and said tubular shroud for rotation in unison, and a plurality of flexible impeller blades disposed radially between said output shaft and the interior surface of said tubular shroud, said flexible impeller blades having a leading edge, a trailing edge and a pair of opposed lateral edges, one of said lateral edges being fixedly attached to said output shaft and a portion of the other of said lateral edges proximate said leading edge being fixedly attached to the interior surface of said tubular shroud, and means for controllably uniformly varying the pitch of said impeller blades by displacing the peripheral corner of the trailing edge of said blades such as to place said trailing edge at an angle to the leading edge of said blade.

---

**4,213,735**

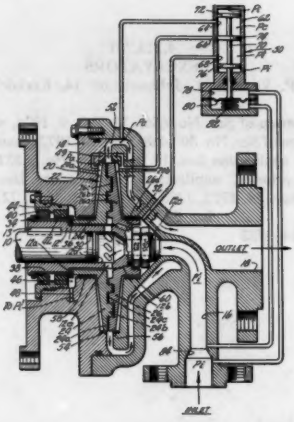
**CONSTANT FLOW CENTRIFUGAL PUMP**

**Charles W. Grennan, Newington, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.**

**Filed Feb. 1, 1979, Ser. No. 8,236**

**Int. Cl.[3] F04D** *15/00;* **F01D** *5/02;* **F03B** *15/02*

**U.S. Cl. 415—21** **4 Claims**



1. In an improved variable geometry impeller pump adapted to provide a constant output flow under varying back pressure of the type comprising: a pump housing having an inlet conduit, an outlet conduit, a pumping cavity and a collector, the inlet conduit being in fluid communication with the pumping cavity and the collector being in fluid communication with the pumping cavity and the outlet conduit, an impeller section mounted for rotation in the housing for impelling fluid into the collector, the impeller section having a hub and a plurality of vanes with first slots defined therebetween, a structure mounted for rotation in the housing, the structure having a hub and a plurality of second slots in which the vanes of the impeller section are received, the improvement comprising:

a shroud connected to the hub of the impeller section and carrying the vanes, the shroud being of such a thickness as to be flexible in the manner of a Belleville spring and forming a chamber with the wall of the pumping cavity adjacent thereto;

means for mounting the hubs of the impeller section and the structure in fixed axial relationship with respect to each other, whereby flexing of the shroud functions to vary the exposed area of the vanes;

supply orifice means to privide a fluid resistance to communication between the collector and the chamber; and

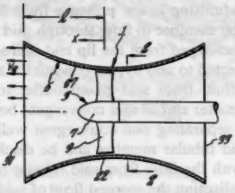
drain orifice means to provide a fluid resistance to communication between the chamber and the inlet conduit.

4,213,736

## TURBOMACHINERY AND METHOD OF OPERATION

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.

Division of Ser. No. 737,065, Nov. 1, 1976, Pat. No. 4,137,709, which is a division of Ser. No. 654,925, Feb. 3, 1976, Pat. No. 4,055,947. This application Jun. 5, 1978, Ser. No. 912,430
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.³ F04D 3/00; B63H 11/08
U.S. Cl. 415—182 26 Claims



1. Turbomachinery comprising an impeller positioned with a diffuser throat, said impeller having at least one blade mounted about a central rotatable hub wherein the chord of said blade root and tip sections is greater than the chord of said blade midsection, and said impeller blade is further defined as having a greater pitch at said tip section than at said blade midsection.

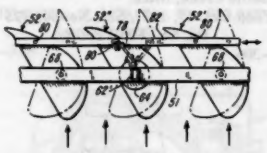
---

4,213,737

## WIND ENGINE

Kyle D. Gerhardt, 4111 S. Yellow Springs Rd., Springfield, Ohio 45506

Filed Jan. 17, 1978, Ser. No. 870,229
Int. Cl.² F03D 7/04
U.S. Cl. 416—41 22 Claims



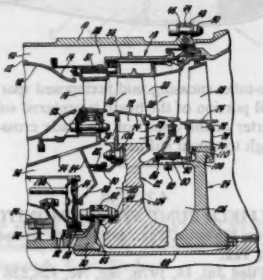
1. Windmill apparatus for use in capturing the energy of the wind and converting it to power comprising a plurality of relatively narrow ring-like bands joined together in a generally concentric radially spaced relation to form a wheel adapted to rotate about means defining therefor a central axis, said wheel in use normally orienting generally perpendicular to a ground surface, a plurality of air foils positioned between successively adjacent bands, in a circularly spaced relation, each said air foil having means pivotally mounting it for adjustment about an axis which is radial to the wheel axis, the surfaces of said foils at their radial extremities being substantially flat, each said foil between its radial extremities being provided with an outer peripheral surface a substantial portion of which is flatted to define its operating face which in use of the foil is generally faced into the prevailing wind, the balance of the said peripheral surface being generally arcuate and departing sharply from said flatted portion to give the foil a generally bulbous configuration at its side opposite that defined by said flatted portion the peak of which has a substantial departure from said flatted portion and there being a relatively low ratio of the length of said flatted portion to the depth of said foil at the location of said peak in a sense transverse to the pivot axis of the foil.

4,213,738

## COOLING AIR CONTROL VALVE

James R. Williams, Martinsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1978, Ser. No. 879,782
Int. Cl.² F01D 5/08, 5/18
U.S. Cl. 416—95 2 Claims



1. A turbine cooling system for use in gas turbine engines having a coolant fluid supply source therein comprising: a turbine component mounted within the engine, means for forming a space internally of said engine having pressurized coolant fluid therein, flow regulator means for conducting coolant fluid from said space to said turbine component including a fixed valve seat, means including a spring biased valve element for defining a pressurizable internal cavity within said flow regulator means, said spring biased valve element being exposed to said space internally of said engine and having the pressurized coolant fluid therein acting thereon, means for continuously directing pressurized coolant fluid from said space into said pressurizable internal cavity to produce a balanced fluid pressure across said valve element wherein only the spring bias thereof is utilized to maintain the valve element in a closed position against the fixed valve seat during engine cruise operation, and sensor means directly sensing the temperature of said turbine component and operable to bleed the continuously applied pressurized coolant fluid from said internal cavity directly in response to the temperature of said turbine component whereby pressure of the coolant fluid in said engine space acts against the spring bias of said valve element to open it to direct increased coolant flow from said space to said turbine component under engine cruise conditions, said sensor means being operative upon cooling of the turbine component to prevent bleed of the continuously applied pressurized coolant fluid from said internal cavity to cause the balanced pressures across said valve element to cause its spring bias to return it to its closed position to reduce the amount of coolant flow from said space within said engine.

---

4,213,739

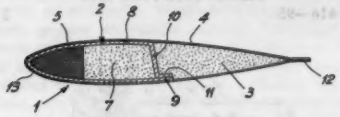
## HELICOPTER ROTOR BLADE

August H. L. Euler, Aix-en-Provence, and Gilbert F. A. Beziac, Salon de Provence, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Feb. 22, 1978, Ser. No. 879,915
Claims priority, application France, Feb. 28, 1977, 77 05767
Int. Cl.³ B64C 27/46
U.S. Cl. 416—226 4 Claims

1. A rotor blade, specially for a helicopter rotor, comprising a substantially D-shaped solid one-part leading edge spar essentially consisting of strands of glass fibre filaments which extend lengthwise over the whole length of the blade; a solid core made of a lightweight cellular substance and juxtaposed to the whole rear face of said D-shaped spar; a sheet-like member extending around said spar and said core and comprising at least one layer of a fabric formed by parallel glass fibres dis-

posed askew of the blade longitudinal axis; a rear filling member, and a covering extending around said sheet-like member and said rear filling member, said sheet-like member being very thick, and specially much thicker than said covering so as to



form a torque-tube, encasing said juxtaposed spar and core, so that the airfoil portion of the blade is centered substantially at the front quarter of the chord of the blade cross-section, and has a very high torsional stiffness.

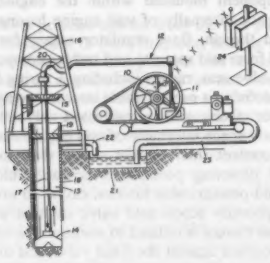
---

**4,213,740**

## OILFIELD PUMP STROKE MONITOR

**Loring C. Chien, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jul. 14, 1978, Ser. No. 924,526**
**Int. Cl.[2] F04B *21/00***
**U.S. Cl. 417—63** **3 Claims**



1. An apparatus for determining the pump strokes of a pump having a moving element that moves cyclically, comprising:

a force sensor mounted on said moving element for sensing said cyclic movement and generating a signal;

an R.F. transmitter mounted on said moving element connected to receive said signal from said force sensor and transmit an R.F. signal; and

an R.F. receiver spaced from said moving element for receiving said R.F. signal from said R.F. transmitter and indicating said pump strokes.

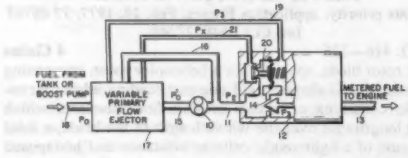
---

**4,213,741**

## VARIABLE FLOW EJECTOR

**Francis R. Rogers, and James M. Eastman, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Oct. 13, 1978, Ser. No. 950,954**
**Int. Cl.[2] F04B *23/04***
**U.S. Cl. 417—79** **11 Claims**




1. A variable area flow ejector for use in a fluid delivery system, said system including a pump, a bypass conduit for returning a portion of the pump outlet flow to the inlet thereof and a metering orifice, comprising,

a hollow ejector body;

a tubular member movably mounted within said ejector body and having a terminating lip within the cavity of said ejector body;

a convergent body movably mounted within the cavity of said ejector body, said convergent body being generally cylindrical in form with a convergent inner wall and being positioned with the larger diameter end thereof surrounding the exterior of said tubular member and the inner wall thereof converging toward said lip;

means for admitting lower pressure fluid from a source to said tubular member to flow through said tubular member and be discharged from the lip end thereof;

means connected to said bypass conduit for admitting higher pressure fluid from said pump outlet to flow into the larger diameter end of said convergent body and through the space separating said convergent wall from the exterior of said tubular member and be discharged into and merged with the flow from said tubular member;

means for collecting the merged flow of said lower pressure fluid and said higher pressure fluid and for returning the same to said pump inlet;

means for adjusting the position of said tubular member relative to said ejector body proportionately to a pressure drop existing across said metering orifice; and

means for adjusting the position of said convergent body relative to said tubular member as a function of the time integral of the difference between the actual pressure drop across said orifice and a desired value of the pressure drop across said orifice.

---

**4,213,742**

## MODIFIED VOLUTE PUMP CASING

**Terry L. Henshaw, Battle Creek, Mich., assignor to Union Pump Company, Battle Creek, Mich.**

**Filed Oct. 17, 1977, Ser. No. 842,725**
**Int. Cl.[2] F03B *3/00***
**U.S. Cl. 417—206** **19 Claims**

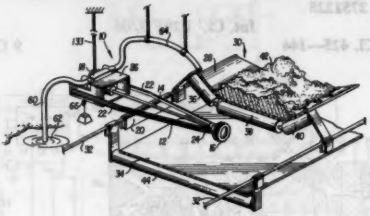
1. A centrifugal pump having a casing, inlet, impeller, throat and cutwater, the improvement comprising: said casing being of a modified volute configuration having in the upstream portion thereof, from the cutwater towards a point generally 180° from the cutwater, a flow area which is greater than would be the flow area of a true volute casing in the same upstream casing portion; the flow area of said casing in the downstream portion thereof, from the throat back upstream towards a point generally 180° from the cutwater, also being greater than would be the flow area of a true volute casing in the same downstream casing portion; and the flow area of the casing in the juncture portion of the pump extending from the upstream portion through a point 180° from the cutwater and to the downstream portion being significantly less than would be the flow area of a true volute casing at said juncture portion.

4,213,743

## PUMP ASSEMBLY DRIVEN BY ENDLESS CONVEYOR

Frank K. Hurt, Bluefield, Va., and Edwin L. Wellons, North Tazewell, Va., assignors to Mefcor, Inc., Bluefield, Va.

Filed Apr. 20, 1978, Ser. No. 898,062
Int. Cl.[2] F04B 9/02, 17/00; F16H 13/10; B65G 21/00
U.S. Cl. 417—229 8 Claims



1. A liquid evacuation system comprising:
an endless conveyer for conveying bulk material;
a pump mounted adjacent to said endless conveyer and including a drive wheel for engaging said endless conveyer to drive said pump and including an inlet hose for extending into liquid to be evacuated and an outlet hose for depositing said liquid onto said endless conveyer;
said drive wheel being positioned below a conveying portion of said endless conveyer and being spaced therefrom when said endless conveyer is empty, but said conveying portion sinking to come into contact with said drive wheel when said endless conveyer is loaded.

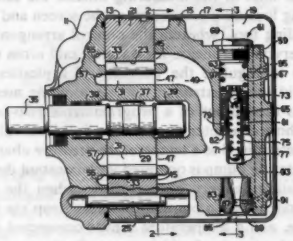
---

4,213,744

## HYDRAULIC PUMP AND IMPROVED BY-PASS FLOW MEANS THEREFOR

Michael D. Davis, Coldwater, and Harold L. Gustner, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 3, 1978, Ser. No. 883,062
Int. Cl.[2] F04B 49/08
U.S. Cl. 417—310 12 Claims



1. In a rotary pump of the type including housing means defining a pumping chamber, a pumping element rotatably disposed in the pumping chamber and defining an axis of rotation, expanding fluid pockets and contracting fluid pockets, the housing means defining a fluid inlet port in communication with the expanding pockets, a fluid outlet port in communication with the contracting pockets, a discharge port for connection to fluid operated apparatus, and a discharge fluid path communicating between the outlet port and the discharge port, means defining a fluid reservoir in open communication with the inlet port and disposed axially adjacent thereto, valve means operable to bypass excess fluid from the discharge fluid path through a bypass port, the improvement comprising: means defining a bypass flow path of generally constant cross-sectional flow area communicating said excess fluid from said bypass port, said bypass flow path including a terminal portion disposed adjacent said inlet port, the cross-sectional area of said terminal portion overlapping the cross-sectional area of said inlet port when the area of said terminal portion is projected in a normal direction to permit at least a portion of said excess fluid to flow directly into said inlet port, said means defining said bypass flow path being disposed within said fluid reservoir and substantially surrounded thereby.

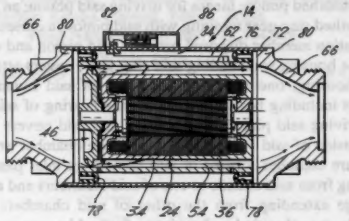
---

4,213,745

## PUMP FOR CENTRAL HEATING SYSTEM

Samuel A. Roberts, Courtways, Holwood Park Ave., Keston Park, Farnborough, Kent, England

Continuation of Ser. No. 681,451, Apr. 29, 1976, abandoned.
This application Sep. 11, 1978, Ser. No. 941,058
Int. Cl.[2] F04B 17/00, 35/00
U.S. Cl. 417—363 8 Claims



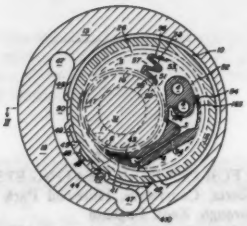
1. In a central heating system including a boiler for heating liquid, heat transfer means for transferring heat from said liquid to the environment, and circulation means including pipe and a pump for circulating liquid through said pipe between said boiler and said heat transfer means, the improvement in said circulation means comprising:
a pump including:
(a) a housing adapted to be connected in series with said pipe,
(b) an induction motor having unencapsulated motor windings and coaxially mounted within said housing, said induction motor having a casing which is unsealed to ensure that liquid enters said casing, said liquid contacting the motor windings for cooling said induction motor, said induction motor for rotating an impeller within said housing to cause said liquid to flow an annular passage between said housing and said casing, and
(c) a motor power supply associated with said induction motor for converting an available alternating current voltage having a given frequency into a modified multiphase alternating current voltage having a higher frequency to energize said induction motor so as to produce a given flow requirement of said central heating system, said modified voltage having an amplitude not exceeding 25 volts and having a frequency greater than 70 Hertz,
whereby said induction motor cannot be energized directly by said available voltage at said given frequency to produce said required flow and must be energized by said modified voltage at said higher frequency to produce said required flow.

4,213,746

## INTERNAL GEAR HYDRAULIC DEVICE WITH BALANCING RECESSES IN THE HOUSING AND CRESCENT SHAPED SEPARATION MEMBER

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed Dec. 8, 1977, Ser. No. 859,789
Int. Cl.[2] F03C 3/00; F04C 1/06, 5/00, 15/00
U.S. Cl. 418—71 4 Claims



1. An internal gear hydraulic device, comprising: an externally-toothed pinion; means for driving said pinion; an internally-toothed ring gear meshing with said pinion; a cresent shaped separation member disposed between said pinion and said ring gear; a housing sorrounding said ring gear; covers attached to said housing, one cover on each end of said housing; said covers including bearing means for the bearing of said means for driving said pinion; said housing and said covers forming on outside of said device; a high-pressure chamber and a low pressure chamber formed in said device; an inlet passage extending from said outside to one of said chambers and an outlet passage extending from the other of said chambers to said outside; one of said chambers being formed by one end of said member, portions of said covers, housing, gear and pinion and the other of said chambers formed on the other end of said member and between other portions of said housing, covers, gear and pinion; substantially as known from the former art and as common in internal gear devices;

wherein a novel arrangement is provided;

wherein said novel arrangement includes a deflectable housing lip on a portion of said housing,

wherein said lip forms the inner wall of a slot,

wherein said slot extends axially from one end of said portion through said portion to the other end of said portion of said housing,

wherein said slot and said lip are located radially of one of said chambers,

wherein said slot includes at least two radial enlargements,

wherein said enlargements are located on the ends of said slot,

wherein said enlargements extend radially inwardly;

wherein said enlargements form narrowed portions on said lip,

wherein said lip between said narrowed portions is radially deflectible,

wherein a passage is provided from said one of said chambers to said slot;

wherein fluid communicates through said passage with said one chamber and said slot to equalize the pressure in fluid in said one chamber and in said slot,

wherein said slot is slightly longer in the peripheral direction than said one chamber,

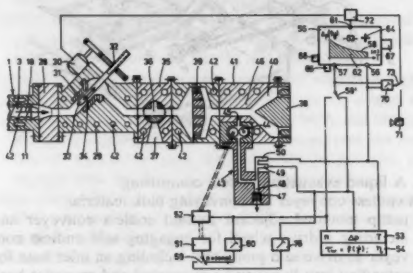
and wherein said lip is pressed by pressure in fluid in said slot against the outer face of said ring gear, when pressure is present in said fluid in said one chamber and in said slot.

4,213,747

## METHOD OF AND APPARATUS FOR CONTROLLING THE VISCOSITY OF MOLTEN PLASTICS MATERIAL WHICH IS TO BE MOULDED

Reinhard Friedrich, Dachtel, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,198
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751225
Int. Cl.[2] B29F 3/06
U.S. Cl. 425—144 9 Claims



1. A control arrangement for a plastics extruder having a casing, which includes a screw extruder, a screen downstream of the screw extruder, a throttle having a cross section located between the screw extruder and the screen wherein said throttle is constructed as an axial annular gap throttle comprising a hollow cylinder and a pin piston axially displaceable therein by a servomotor means, a moulding tool downstream of the screen, and a melt index measuring device disposed in close thermal contact on a casing of the extruder, between said screen and said moulding tool; said melt index measuring device comprising a metering pump whose rotational speed is controllable and which is provided with a rotational speed indicator, a sample flow channel, a measuring nozzle disposed in the sample flow channel, and pressure and temperature sensors connected to the sample flow channel directly upstream of the inlet of the measuring nozzle, the sample flow channel being located downstream of the screen and upstream of the moulding tool, wherein the control arrangement comprises said servometer means for varying said cross section of said throttle to regulate the viscosity of a plastics material melted in said screw extruder, said servomotor means being connected to the output of a programmable two-coordinate controller whose characteristic provides a desired value output and can be determined as a temperature-pressure characteristic when the metering pump is operated with constant delivery, or as a temperature-delivery characteristic when the metering pump is operated with a constant pressure drop via said measuring nozzle, and a temperature sensor connected to one of two actual value inputs of said two-coordinate controller, and wherein at least one of said pressure sensor and said rotational speed indicator is connected to actual value input.

---

4,213,748

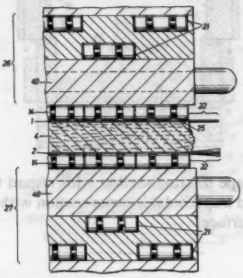
## PRESS FOR COMPACTING MATERIAL TO FORM A TRAVELING WEB

Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed May 2, 1979, Ser. No. 35,344
Claims priority, application Fed. Rep. of Germany, May 6, 1978, 2819943
Int. Cl.[2] B30B 5/06; B29J 5/00; B29D 7/14
U.S. Cl. 425—371 3 Claims

1. A press for forming a traveling compacted web from initially uncompacted material and comprising upper and

lower continuously traveling metal belt spans which are vertically interspaced so said material can be carried therebetween, at least one of said belt spans at ambient temperature having side edges portions which are longer than the belt span area between the side edges portions and means respectively above and below said spans for directly heating and pressing the



spans towards each other while said material is carried therebetween, said at least one of said belt spans having its said side edge portions overhanging said means and free from direct heating thereby, and its said area between said side edge portions directly heated by said means so that said area expands longitudinally, said side edge portions lengthening without being excessively stressed by tension.

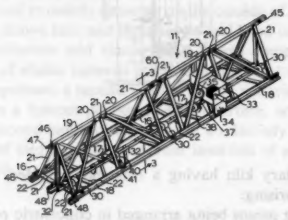
---

**4,213,749**

## PORTABLE VIBRATING CONCRETE SCREED

**Donald R. Morrison, 2109 Camp Green St., Charlotte, N.C. 28208**

**Filed Mar. 6, 1978, Ser. No. 883,955**
**Int. Cl.[2] B28B *1/08***
**U.S. Cl. 425—456** **1 Claim**



1. A portable vibrating concrete screed comprising:

(a) an elongate open structure frame mounting three spaced apart and fixedly positioned parallel blades adapted to engage and level concrete and to support the screed as said screed is moved over the concrete and with the most forward of said blades being adapted to effect a rough smoothing puddling-like action, said elongate open structure frame being in the form of an isosceles triangle in cross section, with the forward and trailing said screed blades being positioned at the lower outer corners of said triangle, said frame including a tubing member positioned at the apex of said triangle, the middle of said three blades being positioned below said apex and substantially evenly spaced between the forward and trailing blades and including cross braces fixed to and extending between said screed blades and said tubing member;

(b) bearings mounted on said frame between the trailing pair of said blades and spaced inwardly from each end of said frame;

(c) a vibrating element including a shaft supported for rotation in said bearing above said trailing pair of blades and extending throughout the length of said frame and beyond said bearings spaced inwardly from each end of said frame and structural means associated with said shaft designed upon rotation of said shaft to allow said shaft to vibrate said frame; and

(d) a drive source carried by said frame for rotating said shaft at a sufficient speed to cause said shaft to impart uniform vibrations throughout the length of the trailing pair of said blades, said drive source comprising a gasoline engine fixed on said frame above the trailing pair of said blades, and belt and pulley means drivingly connecting said engine to said shaft, said engine being mounted in such manner on said frame to cause said screed to creep forwardly during operation thereof.

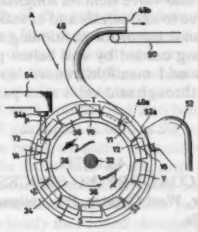
---

**4,213,750**

## ROTARY BLOW MOLDING MACHINE

**Kikuo Kubota; Yoshiaki Yamagishi, both of Kawasaki, and Masaru Yamaguchi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan**

**Filed Nov. 28, 1978, Ser. No. 964,418**
**Int. Cl.[3] B29C *17/07***
**U.S. Cl. 425—531** **16 Claims**

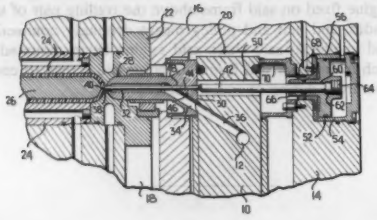


1. A rotary blow molding machine comprising a rotor mounted on a horizontal driving shaft; mold stations mounted on the outer periphery of said rotor so as to be radially disposed and circumferentially equally spaced, said mold stations each carrying thereon a split mold unit capable of opening and closing in the direction of the width of the outer periphery surface of said rotor; flash blow-pipes rotatable with said mold stations, a tip end of each of said flash blow-pipes facing between said mold stations, said mold stations moving on a circular rotation track described by the center of each of said split mold units, said flash blow-pipes being adapted to guide and hold a parison extruded from a die head disposed adjacent to said track, said flash blow-pipes also being adapted to blow off a portion of the scrap parison, which is produced when closing and clamping said split mold units, to a position outside said circular rotation track; ejector means mounted in a wedged form between said split mold units within an area on said circular rotation track within which said split mold units are kept open; mold-release means on said split mold units for releasing a molded article from said split mold units and operable adjacent to said ejector means when said split mold units are open, said ejector means receiving a molded article released by said mold-release means from one mold half of said split mold unit in open state and discharging it to a position outside said circular rotation track.

## 4,213,751
## VALVE GATE MECHANISM FOR INJECTION MOLDING

Luis Fernández, Jona, Switzerland, assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 6, 1978, Ser. No. 913,136
Int. Cl.[2] B29F 1/03
U.S. Cl. 425—566 7 Claims



1. In an injection mold assembly of the type including a batten plate, a manifold standoff plate and a mold end cap coupled together as a structural unit and a separate manifold runner mounted for relative movement within a recess in said manifold standoff plate, a gate valve, said gate valve comprising a nozzle mounted in said end cap and said manifold standoff plate and having a sliding interface with said manifold runner, said nozzle having a discharge orifice, a passage formed in said nozzle and extending from said sliding interface for delivering moldable material to said orifice, a valve member for closing said orifice, said valve member including a valve stem, guide means mounting said valve stem for longitudinal reciprocatory movement relative to said nozzle and in sealed relation relative to said passage, an actuator for positioning said valve member, said actuator being carried by said batten plate, a valve stem passage through said manifold runner, and said valve stem freely extending through said valve stem passage to said actuator.

---

## 4,213,752
## COAL DRYING PROCESS

Walter H. Seitzer, West Chester, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Filed Nov. 6, 1978, Ser. No. 958,308
Int. Cl.[2] F27B 15/00
U.S. Cl. 432—14 9 Claims

1. A single step process for removing moisture from low rank coal using in-situ generated thermal energy by (a) feeding the wet low rank coal at room temperature into a moving bed of hot coal at a temperature in the range of from about 200° C. to about 300° C. at a rate to maintain partial combustion of the coal at atmospheric pressure, (b) maintaining said coal bed in the presence of a gas at atmospheric pressure containing from about 5% to about 20% by volume of oxygen, whereby the in-situ heat generated by the combustion is absorbed by the wet coal being fed to the system and is effective for drying the coal to the desired level, and (c) separating the dried coal from the combustion zone, whereby the dry coal obtained is highly resistant to spontaneous combustion.

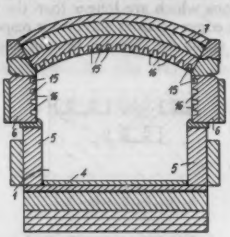
---

## 4,213,753
## HONEYCOMB MUFFLE IN TANK FURNACES FOR GLASS MELTING

Eugenio Negroni, and Roberto Negroni, both of Via De Rolandi 7, 20156 Milan, Italy

Filed Mar. 31, 1978, Ser. No. 892,876
Claims priority, application Italy, Apr. 7, 1977, 22264 A/77
Int. Cl.[2] F27D 1/00
U.S. Cl. 432—247 5 Claims

5. Blocks of refractory material for the construction of tank muffle furnace muffles for glass melting wherein one surface of said blocks is shaped with at least one recess defined by inwardly narrowing projecting ribs, resulting in said recess having a square shape in cross-section with regard to the face of said surface, and trapezoidal in cross-section with regard to the width of said surface.

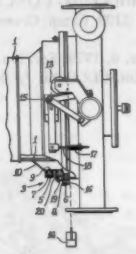


---

## 4,213,754
## SYSTEM FOR SEALING THE ROTARY TUBE OF A ROTARY TUBULAR KILN

Johannes C. Wens, Nijmegen, Netherlands, assignor to Smit Ovens Nijmegen B.V., Nijmegen, Netherlands

Filed Sep. 13, 1978, Ser. No. 941,982
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741738
Int. Cl.[2] F27B 7/24
U.S. Cl. 432—115 5 Claims



1. In a rotary kiln having a rotatable cylinder, a sealing system, comprising:

sealing ring means being arranged in concentric relation to said cylinder,

said sealing rings means comprising a radially extending sealing ring, first packings of heat resistant and slideable material carried by said radially extending sealing ring, for abutting radially extending surfaces,

said radially extending sealing ring pressurizing said first packings in an axial direction against the radially extending surfaces,

an axially extending sealing ring,

second packing of heat resistant and slideable material carried by said axially extending sealing ring for abutting axially extending surfaces, said axially extending ring pressing said second packings against the axially extending surfaces,

mounting means taking up the weight of said radially and axially extending rings and said first and second packings, means extending between said sealing rings and joining the same but allowing selective movement therebetween, and

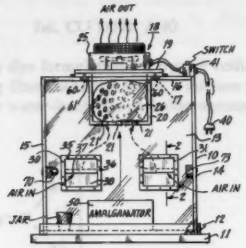
said packings forming a seal between said first and second sealing rings.

4,213,755

## MERCURY VAPOR PURIFIER ENCLOSURE

Leon L. Zweben, 1015 Forest Ave., Lakewood, N.J. 08701

Filed Dec. 22, 1978, Ser. No. 972,244
Int. Cl.[3] A61C 19/00
U.S. Cl. 433—49 10 Claims




1. An environmental enclosure apparatus for use in handling deleterious materials, comprising:

(a) a base platform member having a central work area,

(b) a hollow housing having an opened bottom end relatively congruent with said work area of said platform for positioning said housing on said platform with said bottom end positioned over said central area, said housing having a top wall including an aperture located therein and at least one additional aperture in one of said sidewalls,

(c) a filter assembly removably positioned in said aperture in said top wall, said assembly including a selectively operated fan coupled to a filter housing for drawing air from the hollow of said housing via said filter housing when said fan is operative,

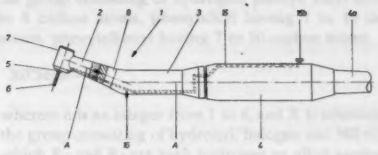
(d) elastic band means coupled to said additional aperture in said sidewall to allow insertion therethrough of a user's hand whereby access to said hollow of said housing can be achieved to mainly cause air on the outside of said housing to be drawn into said housing via said band coupled aperture wherein said elastic band means comprises a first band of elastic material positioned across a top portion of said aperture, a second band of elastic material positioned across a bottom portion of said aperture, with said first and second bands overlapping at a relatively central portion of said aperture to permit insertion of a user's hand therein.

4,213,756

## DENTAL-INSTRUMENT HANDLE

Heinrich Reich, Hochdorf, and Eugen Eibofner, Biberach, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,841
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741148
Int. Cl.[2] A61C 1/08, 1/12
U.S. Cl. 433—126 5 Claims



1. Dental handpiece comprising an elongated handle sleeve transversely divided by formation of an anterior sleeve showing a receptable for a drivable dental treatment instrument and a connected grip sleeve detachable by means of a rotatable tightening ring; said handle sleeve having a coolant line running at least in the area of the transverse space within the inside of the sleeve outside the longitudinal axis of the handle sleeve, said coolant line also being transversely divided and leading to the area of the dental-treatment instrument; and anterior sleeve and the grip sleeve having both two front sides facing each other, one front side being provided with a projecting connecting piece for the cooling line and the other front side being provided with a connecting socket for an insertable connecting piece; the front side of the grip sleeve being provided with guide pins projecting from it and forming catch means opposing pin sockets of elastic material and serving as opposing catch means to accept the guide pins and being admitted into the front end of the anterior sleeve, a connecting socket for the connecting piece of each coolant line also being comprised of elastic material, said guide pins as well as the connecting pieces of each coolant line being mounted at equal intervals along a circular path on the front side of the grip sleeve, said pin sockets and the connecting socket of each coolant line being mounted at equal intervals along a circular path with the same diameter as the previously mentioned circular path on the front side of the anterior sleeve, the connecting pieces of each coolant line being connected with a belt canal from which the cooling line portion of the anterior sleeve leads to the area of the dental-treatment instrument.

4,213,757

## AQUEOUS DYE FORMULATIONS FOR CELLULOSE OR CELLULOSE-CONTAINING FIBERS

Manfred Ruske, Ludwigshafen, and Wolfgang Elser, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

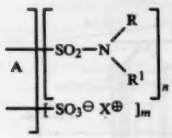
Filed Aug. 1, 1977, Ser. No. 820,717

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636427

Int. Cl.² D06P *1/40*

U.S. Cl. 8—518 14 Claims

1. An aqueous dye formulation for dyeing cellulose or cellulose-containing fibers, which contains a mixture of sparingly water-soluble, or water-insoluble, phthalocyaninesulfonamides of the formula



where A is a (m+n)-valent radical of copper phthalocyanine, cobalt phthalocyanine or nickel phthalocyanine which may be substituted by up to 4 chlorine or bromine atoms, R is hydrogen, alkyl of 1 to 5 carbon atoms or alkoxyalkyl of a total of 3 to 7 carbon atoms, $R^1$ is alkoxyethyl or alkoxypropyl, the alkoxy being of 1 to 8 carbon atoms, or

is a saturated 5-membered or 6-membered heterocyclic ring, $X^{\oplus}$ is a hydrogen ion, an alkali metal ion, $(NH_4)^{\oplus}$ or an ammonium ion of the formula

where R and $R^1$ have the above meanings, n is 2, 3 or 4 and m is 0 or 1, A on average containing 0.5 or fewer sulfonic acid groups, together with one or more dispersing agents and humectants.

---

4,213,758

## OXIDATION HAIR DYES BASED UPON TETRAAMINOPYRIMIDINE DEVELOPERS AND COUPLERS THEREFOR

David Rose, Hilden; Erwin Weinrich, Haan, and Edgar Lieske, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 10, 1978, Ser. No. 868,304

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702118

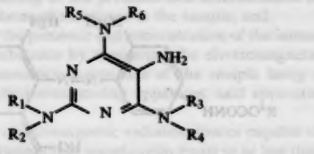
Int. Cl.² A61K *7/13*

U.S. Cl. 8—409 9 Claims

1. A composition of the developer-coupler type for the dyeing of hair, consisting essentially of,

I. as developer, at least one tetraaminopyrimidine selected from the group consisting of

(A) at least one tetraaminopyrimidine of the formula



in which $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ are each selected from the group consisting of hydrogen, phenyl, alkyl having 1 to 4 carbon atoms, phenylalkyl having 7 to 10 carbon atoms, phenylalkenyl having 7 to 10 carbon atoms,

$X(CH_2)n—$

wherein n is an integer from 1 to 4, and X is selected from the group consisting of hydroxyl, halogen and $NR_7R_8$—in which $R_7$ and $R_8$ are each hydrogen or alkyl having 1 to 4 carbon atoms, and together with the nitrogen atom $R_7$ and $R_8$ form a member selected from the group consisting of a 5 to 6 membered heterocyclic ring optionally containing an additional nitrogen atom or oxygen atom, and wherein $R_1$ and $R_2$, or $R_2$ and $R_4$, or $R_5$ and $R_6$, together with the nitrogen atom form a five to six membered heterocyclic ring optionally containing another nitrogen or oxygen atom in the ring, and,

(B) at least one water-soluble acid addition salt of (A), and,

II. as coupler, 2,4-diaminophenol, said developer and said coupler being present in the molar range of about 2:1 to 1:2.

---

4,213,759

## COLORATION PROCESS: MIXED DYES FOR DIFFERENTIAL-DYEING NYLON MIXTURES

Denis R. A. Ridyard, and Charles W. Taylor, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 889,925, Mar. 24, 1978, abandoned. This application Nov. 20, 1978, Ser. No. 962,787

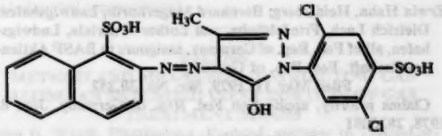
Claims priority, application United Kingdom, Apr. 5, 1977, 14314/77

Int. Cl.² C09B *27/00, 45/43*

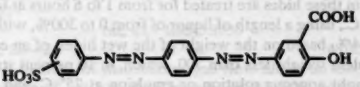
U.S. Cl. 8—643 2 Claims

1. A process for dyeing a mixture of differential dyeing nylon fibres which comprises treating said mixture in an aqueous dyebath having a pH of 5–8 and consisting essentially of dyes selected from at least two of the following classes, the dyes being shown in the form of the free acids:

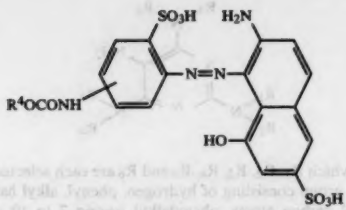
(i) a yellow dye of the formula:



(ii) orange dyes of the formula:

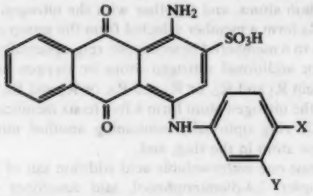


(iv) red dyes of the formula:



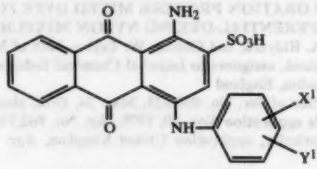
wherein the $R^4OCONH$— group is in the 4— or 5-position relative to the azo group and $R^4$ represents an alkyl, cycloalkyl, or aralkyl radical containing from 4 to 8 carbon atoms;

(v) blue dyes of the formula:



wherein one of X and Y represents $—SO_3H$ and the other represents $—NHCOOR^5$ wherein $R^5$ represents an alkyl, cycloalkyl or aralkyl radical containing up to 8 carbon atoms; and

(vi) blue dyes of the formula:



wherein one of $X^1$ and $Y^1$ represents $—SO_3H$ and the other represents a chlorine atom.

---

**4,213,760**

## DELIMING OF HIDES

**Erwin Hahn, Heidelberg; Bernhard Magerkurth, Ludwigshafen; Dietrich Lach, Friedelsheim, and Lothar Wuertele, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed May 11, 1979, Ser. No. 38,252**

**Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825081**

**Int. Cl.² C08C *1/00, 1/08***

**U.S. Cl. 8—94.17** **3 Claims**

1. A process for deliming conventionally limed hides, wherein these hides are treated for from 1 to 6 hours at from 5° to 35° C., using a length of liquor of from 0 to 300%, with from 0.8 to 4%, based on the weight of the wet hides, of an ester of equivalent weight less than 300, which, in 10 percent strength by weight aqueous solution or emulsion at 25° C. and pH 9, hydrolyzes to the extent of at least 90% in the course of two hours.

**4,213,761**

## PROCESS FOR TREATING CELLULOSIC MATERIALS WITH LIQUID AMMONIA

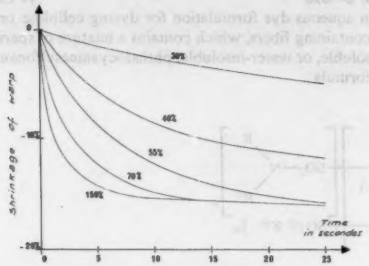
**Jean-Paul Dalle, 4917 Big Bend, Wichita Falls, Tex. 76310**

**Continuation of Ser. No. 580,705, May 27, 1975, abandoned. This application Mar. 3, 1978, Ser. No. 883,193**

**Claims priority, application France, May 28, 1974, 74 18331**

**Int. Cl.² D06B *7/04, 7/08***

**U.S. Cl. 8—125** **4 Claims**




1. In a process for treating a textile material such as yarn, fabric or the like, for the purpose of improving the dye affinity, dimensional stability and tensile strength of the textile material, said material being comprised in part or entirely of natural or regenerated cellulosic fibers, wherein said textile material is impregnated with liquid ammonia in am amount of more than 75% by weight and stresses are applied to said material while it is in a plastic state due to impregnation with ammonia and wherein said stresses are reduced while ammonia is being removed from said textile material, the improvement comprising the steps of:

impregnating said textile material with ammonia and applying stresses to said impregnated material of about 25% to 30% of the breaking load of said material for ten or more seconds;

removing a first portion of said ammonia such that the degree of impregnation is less than 75% by weight after less than 3 seconds while stresses are reduced to about 15% of the breaking load;

removing a second portion of said ammonia such that the degree of impregnation is less than 30% by weight after less than 60 seconds while stresses remain approximately the same as those which were applied during the preceding step;

and removing the balance of the impregnated ammonia while maintaining the stresses below 5% of the breaking load of the said textile material, said ammonia being removed at such rate that the degree of impregnation is less than 15% by weight after less than 300 seconds, wherein all time intervals for ammonia removal are measured from the start of ammonia removal.

---

**4,213,762**

## DETERMINATION OF CHROMATE ION IN DRILLING MUD FILTRATES

**Donald L. Whitfill, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.**

**Filed Dec. 14, 1978, Ser. No. 969,606**

**Int. Cl.² G01N *33/24***

**U.S. Cl. 23—230 R** **3 Claims**

1. A method of determining the amount of chromate ion in an aqueous drilling mud filtrate containing organic color bodies such as lignosulfonate wherein the method comprises:

(a) treating the aqueous filtrate with an effective amount of hydrogen peroxide to destroy said color bodies, and

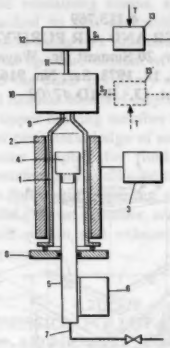
(b) measuring the amount of chromate ion in the filtrate by means of a spectrophotometer.

4,213,763

## METHOD AND DEVICE FOR ANALYZING GEOLOGICAL SEDIMENTS AND FOR DETERMINING THEIR ORGANIC SULFUR CONTENT

Marcel Madec, Suresnes; Jean Espitalie, Le Vesinet; Jean-Loup Laporte, Rulil-Malmaison, and Imre Barsony, Clamart, all of France, assignors to Institut Francais du Petrole, France

Filed Dec. 30, 1977, Ser. No. 866,065
Claims priority, application France, Dec. 30, 1976, 76 39539
Int. Cl.[2] G01N *31/12, 33/24*
U.S. Cl. 23—230 EP 13 Claims



1. A method for determining the degree of evolution of organic material in a plurality of samples of a sedimentary series, comprising, for each sample:

placing the sample in a non-oxidizing atmosphere,

heating the sample to a determined temperature at which the organic material of the sample is pyrolyzed, forming pyrolysis products,

oxidizing or burning the resulting pyrolysis products, forming oxidation products,

detecting the sulfur compounds contained in the oxidation products,

generating a signal representing the overall sulfur content of the oxidation products, for each sample, and

determining from the value of said signal, in combination with a parameter characterizing the sample, the degree of evolution of the organic material in the sample.

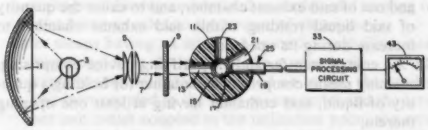
---

4,213,764

## METHOD FOR DETERMINING IMMUNOCHEMICAL SUBSTANCES

John J. O'Connor, Rowland Heights, Calif., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 909,862, May 26, 1978, abandoned. This application Aug. 9, 1978, Ser. No. 932,594
Int. Cl.[2] G01N *33/16, 21/24*
U.S. Cl. 23—230 B 53 Claims




1. A method for detecting and measuring a predetermined specifically-bindable immunochemical substance in a liquid sample in a cuvette, comprising the steps of:

(a) providing, in an immunoassay technique for the liquid sample in said cuvette, a component comprising a suspension of particles which may be agglutinated or insolubilized in relationship to the presence and concentration of the immunochemical substance in the sample; and

(b) determining the presence and concentration of the immunochemical substance by measuring the electromagnetic radiation transmission properties of the sample using a calibrated radiation-measuring apparatus, said apparatus comprising:

(1) a suitable electromagnetic radiation source capable of providing radiation at wavelengths equal to or less than the mean diameter of said particles;

(2) means for concentrating and collimating radiation from the electromagnetic radiation source to form a beam;

(3) means for filtering the beam to (i) eliminate radiation having wavelengths greater than the means diameter of the particles and (ii) transmit radiation, which radiation has a range, whereby the upper wavelength is equal to or below the mean diameter of the particles, and the range is of at least about 100 nm;

(4) means for (i) positioning a sample-containing cuvette and for (ii) allowing the filtered beam incident on the cuvette to be transmitted through the cuvette and sample, and for (iii) receiving a portion of the filtered beam transmitted through the sample at two or more predetermined angles with respect to the beam; and

(5) means for detecting and measuring the portion of the beam transmitted at a predetermined angle.

---

4,213,765

## OXIDATIVE COAL DESULFURIZATION USING LIME TO REGENERATE ALKALI METAL HYDROXIDE FROM REACTION PRODUCT

Stephen T. Wilson, Shrub Oak, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 2, 1979, Ser. No. 119
Int. Cl.[2] C10L *9/10;* C10B *57/00*
U.S. Cl. 44—15 R 3 Claims

1. A process for the removal of pyrite from coal which comprises (a) preparing an aqueous slurry containing finely-divided coal particles; (b) adding to the slurry an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide, as well as mixtures thereof, in amounts sufficient to continuously maintain the pH of the slurry at a value of below about 8; (c) agitating the slurry while treating the slurry with oxygen or an oxygen-containing gas at substantially atmospheric pressure and at a slightly elevated temperature of at least about 70° C. to convert the pyrite in the coal to a soluble alkali metal sulfate; (d) reacting lime with the so-formed alkali metal sulfate to regenerate the alkali metal hydroxide, and (e) recycling the hydroxide for further use in the process, whereby pyrite is effectively removed and the hydroxide conveniently regenerated with the inhibiting effect of calcium ions therein upon the oxygen leaching of said pyritic sulfur from coal being overcome at said pH, the reaction rate being enhanced by the use of said elevated temperature.

---

4,213,766

## METHOD AND MEANS FOR DISTRIBUTING GAS ALONG AN EXTENDED INLET PORTION OF GAS TREATMENT MEANS

John G. Wyatt, Birmingham, England, assignor to Lodge-Cottrell, Ltd., Birmingham, England

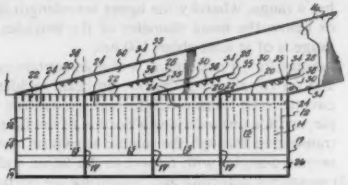
Filed Aug. 10, 1978, Ser. No. 932,723
Claims priority, application United Kingdom, May 5, 1978, 37108/77
Int. Cl.[2] B03C *3/36*
U.S. Cl. 55—2 47 Claims

1. In a method of distributing gas flow along an extended inlet portion of gas treatment means, which inlet portion extends transversely to a longitudinal axis of the gas treatment means and to which inlet portion gas for the treatment is con-

ducted in turbulent flow by a conduit which is at an angle to the longitudinal axis of the gas treatment means, wherein a first conduit wall portion extends to an upstream region of the inlet portion and a second conduit wall portion extends at an acute angle to said longitudinal axis to a downstream region of the inlet portion; the improvement wherein the thickness of the turbulent zone of the gas boundary layer on the second wall portion is increased so as to urge the gas towards the upstream region of the inlet by aerodynamic spoiler means comprising a plurality of projections provided on the second wall portion adjacent to the inlet portion.

22. Gas treatment plant comprising:

(a) gas treatment means having an extended inlet portion transverse to a longitudinal axis of the gas treatment means;



(b) conduit means for conducting gas to the inlet portion and being at an angle to the longitudinal axis of the gas treatment means, the conduit means having a first conduit wall portion extending to an upstream region of the inlet portion and a second conduit wall portion extending at an acute angle to said longitudinal axis and extending to a downstream region of the inlet portion; and

(c) aerodynamic spoiler means on the second wall portion adjacent to the inlet portion for enhancing even distribution of the gas flow across the inlet portion, said spoiler means comprising a plurality of projections each having a substantial linear dimension transversely of said longitudinal axis.

---

**4,213,767**

**ELECTROSTATIC PRECIPITATION**

**Vincent M. Albanese, Lockport, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Filed May 14, 1979, Ser. No. 38,597**

**Int. Cl.[2] B03C *1/00***

**U.S. Cl. 55—5** **2 Claims**

1. A method of improving the conductivity of particles entrained in a stream of particle-laden gas formed by the burning of coal, which particles are collected by an electrostatic precipitator which comprises treating said gas containing particles prior to contact with the electrostatic precipitator at a temperature not greater than about 800° F. with a resistivity-decreasing amount of hexamethylene tetramine or its water-soluble salts and thereafter passing the gas to the electrostatic precipitator.

---

**4,213,768**

**NONDESTRUCTIVE TESTING OF HEPA FILTERS**

**Albert J. Bauman, 524 Oakdale Dr., Sierra Madre, and Frank A. Morelli, 1320 Carthage Ct., Claremont, both of Calif. 91024**

**Filed Nov. 27, 1978, Ser. No. 963,803**

**Int. Cl.[2] B01D *46/10, 46/52, 46/54***

**U.S. Cl. 55—97** **9 Claims**

1. Method of non-destructively testing the integrity of a high efficiency particulate air filter having a frame and a filter pack sealed in the frame, said filter pack comprising a tightly packed axially extended alternating series of separators and parallel reverse turns of glass cloth along which a liquid tends to wick; said method including generating an aerosol in a gas stream of solid particles free of said liquid and having a hydrophobic surface and a mean average diameter of not more than 0.2 micron, exposing the filter to be tested to said aerosol under predetermined test conditions including a temperature at which said particles remain solid, and a pressure differential across the filter urging said gas stream aerosol through the filter.

9. Method of generating an aerosol for non-destructive testing of a HEPA filter including coating silica particles having a mean average diameter of not more than 0.2 microns with an organosilane of more than 4 carbon atoms, and thereafter dispersing said silica particles in an inert gas stream.

---

**4,213,769**

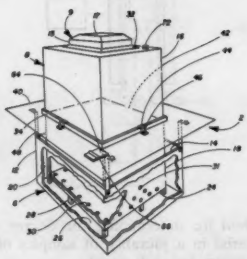
**ENERGY TRANSFER AND AIR PURIFYING DEVICES**

**Edward B. Nagelmeyer, 20 Summit Dr., Wayne, N.J. 07470**

**Filed Jun. 19, 1978, Ser. No. 916,444**

**Int. Cl.[2] B01D *47/02***

**U.S. Cl. 55—216** **28 Claims**



1. An energy transfer and air purifying device, comprising:

containing means comprising a container for holding a quantity of liquid, said container having at least one opening therein;

a quantity of liquid located within said container to receive incoming air; guide means surrounding said container and connected thereto for guiding said incoming air to said liquid; exhaust means comprising an exhaust chamber disposed within said guide means and having a lower end disposed in spaced-apart relationship within said container and in contact with said liquid, and an outlet means extending through said guide means and located at the opposite end thereof;

a bottom end plate located at the lower end of said exhaust chamber, said bottom end plate defining a plurality of openings to permit the ingress and egress of said liquid, said openings being dimensioned and positioned adjacent the perimeter of said end plate in such a manner as to cause said liquid to rotate turbulently within said exhaust chamber so as to provide maximum scrubbing of said air by said liquid; and

vacuum means adapted for fluid-tight communication with said container and said liquid to exert a fluid pressure sufficient to force said incoming air through said liquid and out of said exhaust chamber, and to cause the quantity of said liquid residing within said exhaust chamber to increase during its operation.

22. An energy transfer and air purifying device comprising:

containing means comprising a container for holding a quantity of liquid, said container having at least one opening therein;

a quantity of liquid located within said container to receive incoming air;

exhaust means comprising an exhaust chamber having a lower end disposed in spaced-apart relationship within said container and in contact with said liquid, and an outlet means located at the opposite end thereof, said exhaust means also including an outer peripheral ledge;

a bottom end plate located at the lower end of said exhaust chamber, said bottom end plate defining a plurality of openings to permit the ingress and egress of said liquid, said openings being dimensioned and positioned adjacent the perimeter of said end plate in such a manner as to cause said liquid to rotate turbulently within said exhaust chamber so as to provide maximum scrubbing of said air by said liquid;

guide means surrounding said container and connected thereto for guiding said incoming air to said liquid, said guide means including an outer wall surrounding said containing means, a fluid space defined between said outer wall and said containing means, and an upper limiting member attached to said containing means, said upper limiting member being of a substantially planar configuration having an aperture therein of substantially identical dimension to the outer periphery of said exhaust means, wherein said exhaust means is disposed through said aperture of said upper limiting member and restrained therein by said outer peripheral ledge of said exhaust means; and

vacuum means adapted for fluid-tight communication with said container and said liquid to exert a fluid pressure sufficient to force said incoming air through said liquid and out of said exhaust chamber, and to cause the quantity of said liquid within said exhaust chamber to increase during its operation.

---

**4,213,770**

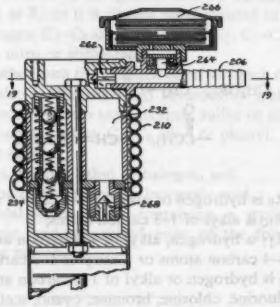
## ENGINE EMISSION POLLUTANT SEPARATOR

**John W. Schaefer, 640 Murray La., Des Plaines, Ill. 60016**

**Continuation-in-part of Ser. No. 764,707, Feb. 1, 1977, abandoned, which is a continuation of Ser. No. 566,608, Apr. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 415,649, Nov. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 308,496, Nov. 21, 1972, abandoned. This application Apr. 2, 1979, Ser. No. 25,860**

**Int. Cl.[2] B01D *51/00*; F02B *33/00***

**U.S. Cl. 55—269** **9 Claims**



1. A pollutant separator for reducing contaminants in a flow from a source of emission to a utilization point comprising:

a cooling coil having an inlet and an outlet, said cooling coil inlet being coupled to the source of emissions;

filter means having an inlet and an outlet, said filter means inlet coupled to the outlet of the cooling coil;

a scrubber unit having an inlet and an outlet, the scrubber unit inlet coupled to the filter means outlet and the scrubber unit outlet coupled to the utilization point, the scrubber unit including;

a closed chamber;

a primary scrubber tube having a first and a second end and having a plurality of holes in the wall thereof communicating with the closed chamber, the first end of the primary scrubber tube being coupled to the filter means outlet and the second end of the primary scrubber tube being coupled to the utilization device, the scrubber tube having an external shoulder;

a plurality of scrubber balls movably positioned within the bore of said tube;

a plurality of springs each respectively arranged between two of the scrubber balls to provide resilient biasing of said balls;

a ring valve movably covering a portion of the outer surface of the primary scrubber tube, the ring valve having a shoulder portion extending outwardly;

a ring valve spring for biasing the ring valve shoulder and the scrubber tube into context;

a fluid passage connecting the interior of the primary scrubber tube to the surface of the scrubber tube shoulder such that fluid pressure is exerted therethrough to the shoulder of the ring valve to provide fluctuating pressure within the scrubber means to enhance motion of the scrubber balls therein.

---

**4,213,771**

## FILTER AND METHOD OF MAKING

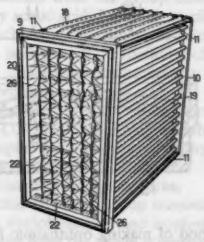
**Jean-Pierre Guibet, Vernon, France, assignor to Air Industrie, Cedex, France**

**Filed Jul. 3, 1978, Ser. No. 921,813**

**Claims priority, application France, Jul. 5, 1977, 77 20690**

**Int. Cl.[2] B01D *46/52***

**U.S. Cl. 55—483** **9 Claims**



1. An improved filter having an assembly of a material from which there are formed first channels with filtering walls, disposed in first parallel rows open at one end of said filter so as to be in communication with an inlet for gas from which dust is to be removed, and an assembly of second channels with filtering walls, disposed in second rows parallel to each other, adjacent, interleaved and also parallel to said first rows, said second channels being open at the opposite end of said filter so as to be in communication with an outlet for said gas from which the dust has been removed, said first and second channels having a polygonal cross-section, said first and second rows, overlying one another, the walls of said first channels being adjacent the walls of said second channels, the improvement comprising adjacent channels of said first rows extending in a first direction of said filter connected in pairs substantially over the whole of their length along fixed lines extending along their common edges and aligned in said first direction, the adjacent channels of said first rows extending in a second direction perpendicular to the first and being likewise connected in pairs substantially over the whole of their length along fixed lines extending along their common edges and aligned in said second direction, said arrangement resulting in the formation of the channels of said second rows, and means for tensioning the assemblies of said first and second channels in said first and second directions perpendicular to each other and perpendicular to the center line of said channels so as to maintain the polygonal shape of said cross-section of said channels, said tensioning means being disposed external to said channels and out of the path of gas flowing through said inlet and said outlet.

9. A process for manufacturing a filter comprising the steps of,

forming strips in pieces of filtering fabric by executing regular spaced stitching lines in the direction of said strips of filtering fabric,

passing said strips behind one set of corresponding tensioners to form sleeves of loops of fabric for receiving said one set of tensioners disposed along one of the sides of said filter,

fixing the ends of said strips by stitching lines thereby forming sleeves for receiving a second set of tensioners disposed along the adjacent side of said filter, and further executing, row by row, along said direction rows of further stitching lines for fixing the strips in pairs at regular intervals.

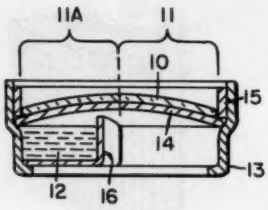
---

**4,213,772**

## PROCESS FOR PRODUCING A GRADIENT PHOTOCHROMIC OPHTHALMIC LENS

**Richard S. Lemker, and Clyde H. Storey, both of Harrodsburg, Ky., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Apr. 8, 1976, Ser. No. 674,897**
**Int. Cl.[2] C03B *32/00*; C03C *23/00***
**U.S. Cl. 65—30 R** **5 Claims**




5. In a method of making ophthalmic lenses with gradient photochromic behavior in a heat treatment furnace from a lens blank composed of a potentially phototropic or photochromic glass containing all the necessary ingredients including uniformly dispersed silver halide therein to develop photochromic behavior during heat treatment which comprises the steps of

(a) mounting of the lens blanks in a carrier for furnace heat treatment and heating said mounted lens blanks in a heat treatment furnace at a temperature sufficient to develop photochromic behavior in the potentially photochromic glass while

(b) maintaining selected portions of the said lens blanks at a temperature to substantially inhibit development of the photochromic behavior by placing a porous refractory with an evaporable liquid therein in proximity of the selected portions to maintain a progressive heat gradation in the lens blanks so that gradient photochromic behavior is produced therein.

---

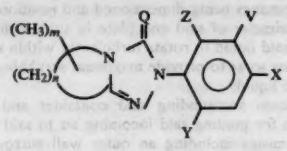
**4,213,773**

## HERBICIDAL SUBSTITUTED BICYCLIC TRIAZOLES

**Anthony D. Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 758,996, Jan. 13, 1977, abandoned. This application Nov. 17, 1977, Ser. No. 851,731**
**Int. Cl.[2] A01N *9/22*; C07D *471/04*, *487/04***
**U.S. Cl. 71—92** **64 Claims**

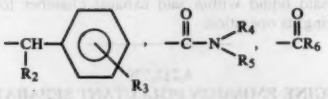
1. A compound having the formula



wherein:

V is hydrogen, fluorine, chlorine, bromine, hydroxy, alkyl of 1–4 carbon atoms or —$OR_1$ wherein:

$R_1$ is alkyl of 1–6 carbon atoms optionally substituted with 1–3 fluorines, chlorines or bromines, cycloalkyl of 4–6 carbon atoms, cycloalkylalkyl of 4–7 carbon atoms, alkenyl of 3–6 carbon atoms optionally substituted with 1–3 fluorines, chlorines or bromines, alkynyl of 3–6 carbon atoms, $CHR_7R_8$ or



wherein:

$R_2$ is hydrogen or methyl;

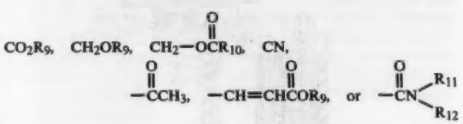
$R_3$ is hydrogen, chlorine, bromine, methyl or methoxy;

$R_4$ is alkyl of 1–4 carbon atoms;

$R_5$ is hydrogen, methyl or methoxy;

$R_6$ is alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms;

$R_7$ is hydrogen or alkyl of 1–4 carbon atoms; $R_8$ is



$R_9$ is hydrogen or alkyl of 1–4 carbon atoms;

$R_{10}$ is alkyl of 1–3 carbon atoms;

$R_{11}$ is hydrogen, alkyl of 1–4 carbon atoms, alkenyl of 3–4 carbon atoms or alkoxy of 1–2 carbon atoms; and

$R_{12}$ is hydrogen or alkyl of 1–2 carbon atoms

X is fluorine, chlorine, bromine, cyano, methyl methoxy or nitro;

Y is hydrogen, fluorine, chlorine, bromine or methyl;

Z is hydrogen, fluorine, chlorine or bromine;

n is 3, 4 or 5;

m is 0, 1 or 2; and

Q is oxygen or sulfur;

provided that

(1) When V is other than hydrogen, Y must be other than hydrogen;

(2) When m is 1, n is 4 and Y must be other than hydrogen;

(3) When m is 2, n is 4, X and Y are chlorine and V is —$OR_1$ wherein $R_1$ is alkyl of 1–4 carbon atoms;

(4) When Q is sulfur, m is O;

or an agriculturally suitable salt thereof.

33. A method for the control of undesirable vegetation comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.

## 4,213,774
## PYRIDYLOXY-PHENOXY-α-PROPIONIC ACID AMINOALKYL ESTERS

**Rolf Schurter; Hermann Rempfler, and Beat Böhner, all of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

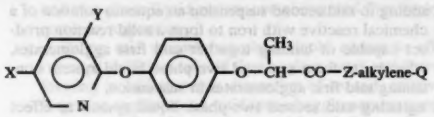
**Filed Jan. 22, 1979, Ser. No. 5,538**

**Claims priority, application Switzerland, Jan. 27, 1978, 928/78**

**Int. Cl.[2] C07D *213/64;* A01N *9/22***

**U.S. Cl. 71—94** **10 Claims**

1. A pyridyloxy-phenoxy-α-propionic acid-aminoalkyl ester of the formula I




(I)

in which

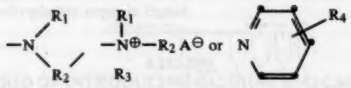
X is a halogen atom or the trifluoromethyl group,

Y is hydrogen, a halogen atom or the trifluoromethyl group,

Z is oxygen or sulfur,

"alkylene" is a straight-chain or branched-chain $C_2$–$C_6$ alkyl group which can be interrupted by oxygen,

Q is an amino or ammonio group




$R_1$ is hydrogen, $C_1$–$C_6$ alkyl unsubstituted or substituted by hydroxyl, halogen, cyano, $CC_1$–$C_4$ alkoxy, carboxyl or $C_1$–$C_4$ alkoxycarbonyl, or it is $C_3$–$C_6$ alkenyl unsubstituted or substituted by halogen, or it is $C_3$–$C_6$ alkynyl,

$R_2$ is the same as $R_1$ or it is phenyl unsubstituted or substituted by halogen, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, $C_1$–$C_4$ alkylthio, cyano, nitro or trifluoromethyl,

$R_1$ and $R_2$ together with the nitrogen atom to which they are bound are also a 5–6-membered heterocycle which can contain as second hetero atom oxygen, sulfur or nitrogen, and can be substituted by $C_1$–$C_4$ alkyl or phenyl,

$R_3$ is the same as $R_1$,

$R_4$ is hydrogen, methyl, ethyl or halogen, and

$A^{\ominus}$ is the anion of an organic or inorganic acid.

7. A herbicidal composition containing a pyridyloxy-phenoxy-propionic acid-aminoalkyl ester of the formula I, claim 1, as active ingredient.

---

## 4,213,775
## DIPHENYL ETHER DERIVATIVES AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME

**Shigeki Nagai; Hakobu Sekioka; Mitsuaki Takenaka; Masazumi Sakata; Yosio Kawaguchi; Seiji Takamura, and Minoru Nishimura, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan**

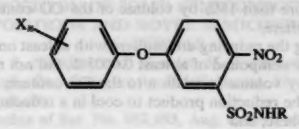
**Continuation-in-part of Ser. No. 926,022, Jul. 19, 1978, abandoned. This application Jan. 26, 1979, Ser. No. 6,919**

**Claims priority, application Japan, Jul. 28, 1977, 52-89729; Nov. 10, 1978, 53-137921**

**Int. Cl.[2] C07C *143/833, 143/83, 143/78;* A01N *9/30***

**U.S. Cl. 71—103** **10 Claims**

5. A herbicidal composition which comprises (i) as an active ingredient a herbicidally effective amount of a compound having the formula




wherein X is a halogen atom or a trifluoromethyl group, n is an integer of 1 to 3 inclusive, and R is a hydrogen atom, a lower alkoxycarbonyl group, an acetyl group, a chloroacetyl group, an N,N-dimethylcarbamoyl group, a lower-alkyl group, a lower-alkenyl group or a benzoyl group; and an alkali metal salt thereof; and (ii) an agriculturally acceptable carrier.

---

## 4,213,776
## HERBICIDAL CONCENTRATE CONTAINING KETONE AND AMIDE SOLVENTS

**Lawrence J. Glilck, and John S. Lojek, both of Elmira, Canada, assignors to Uniroyal Ltd., Ontario, Canada**

**Filed Dec. 18, 1978, Ser. No. 970,011**

**Claims priority, application Canada, Dec. 13, 1978, 317847**

**Int. Cl.[2] A01N *17/00***

**U.S. Cl. 71—117** **3 Claims**

1. A concentrated herbicidal solution comprising, in admixture:

(a) a herbicidal ester of at least one chlorinated phenoxy alkanoic acid selected from the group consisting of 2,4-dichlorophenoxy acetic acid, 2,4-dichloro-phenoxy propionic acid, 2,4-dichlorophenoxy butyric acid, 2-methyl-4-chlorophenoxy acetic acid, 2-methyl-4-chlorophenoxy propionic acid, 2-methyl-4-chlorophenoxy butyric acid and 2,4,5-trichlorophenoxy acetic acid;

(b) at least one urea-type herbicide selected from the group consisting of 3-(3,4-dichlorophenyl)-1-methoxy-1-methyl urea, 3-(p-chlorophenyl)-1-methoxy-1-methyl urea, 3-(3,4-dichlorophenyl)-1,1-dimethyl urea, and 3-(4-bromo-3-chlorophenyl)-1-methoxy-1-methyl urea;

(c) a solvent selected from the group consisting of methyl isobutyl ketone, cyclohexanone and isophorone; and

(d) a solvent selected from the group consisting of dimethyl formamide, dimethyl acetamide and N-methyl pyrrolidone,

the concentration of (a) being at least 40% by weight based on the total weight of (a), (b), (c) and (d), the concentration of (b) being at least 10% based on the total weight of (a), (b), (c) and (d), the amount of (c) plus (d) being sufficient to dissolve (a) and (b), and the ratio of (c) to (d) being within the range of from 1:1 to 10:1 by weight, the said solution being stable on storage at low temperature.

---

## 4,213,777
## MAKING IRON POWDER HAVING FIBER-LIKE PARTICLES

**Klaus Grebe, Kettwig, and Hans De Haas, Meerbusch, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany**

**Continuation of Ser. No. 783,004, Mar. 30, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 931,886**

**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2614342**

**Int. Cl.[2] B22F *1/04;* C21B *13/00***

**U.S. Cl. 75—0.5 BA** **12 Claims**

1. Method of making iron powder, in which the particles have fiber-like configuration, comprising the steps of using regular iron oxide as raw material which has not been produced by a spray calcination,

reducing said iron oxide in an atmosphere of carbon oxide and nitrogen at a temperature within the range of 750° to 1200° C.;

limiting a hydrogen content in the reducing atmosphere during the last phase of reducing, but beginning not later

than the commencing of precipitation of metallic iron, to not more than 15% by volume of the CO content in the atmosphere;

providing the reducing atmosphere with at least one gaseous sulphur compound of at least 0.0005%, but not more than 0.1% by volume in relation to the CO content;

causing the reduction product to cool in a reducing or inert atmosphere; and

grinding the cooled product to powder.

---

**4,213,778**

## PROCESS FOR TREATING A MUD PRODUCED DURING GAS SCRUBBING IN A BLAST FURNACE OR A STEELWORKS

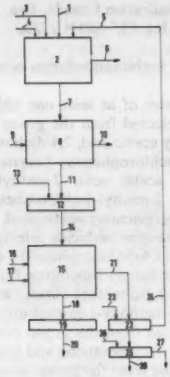
**Claus Sitz, Lübeck, Fed. Rep. of Germany, assignor to Metallhüttenwerke Lubeck GmbH, Fed. Rep. of Germany**

**Filed Dec. 22, 1978, Ser. No. 972,419**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758118**

**Int. Cl.² C21B *3/04***

**U.S. Cl. 75—25** **20 Claims**



1. Process for treating muds produced during gas scrubbing in blast-furnace and steelworks, more particularly arising out of blast-furnace throat-gas cleaning, and subjected to concentration after the cleaning process, characterised in that, the mud is subjected to a decantation procedure, and is then mixed with a granular reducible carbon addition while still in the free-flowing condition, the mixture being fed in a condition containing 35 to 55% by weight of $H_2O$ directly to a rotary tube furnace then being dried in said furnace with a countercurrent gas flow and the said mixture being treated extensively in the furnace zone at a temperature of 900° to 1300° C. under conditions ensuring agglomeration, volatilisation of zinc and lead and at least partial reduction of the iron oxides, then added to the charge material for the iron-making after discharge and cooling.

---

**4,213,779**

## TREATMENT OF STEEL MILL WASTE MATERIALS

**Bruce F. Caswell, Whitmore Lake, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.**

**Filed Sep. 19, 1977, Ser. No. 834,304**

**Int. Cl.² C22B *1/16, 1/243, 1/244;* C21B *13/00***

**U.S. Cl. 75—34** **10 Claims**

1. A process for forming agglomerates from particles of iron-containing steel mill waste, which comprises the steps of:

a. forming a suspension of said steel mill waste particles in water,

b. adding to said suspension (i) a first hydrophobic organic liquid which is immiscible with water and (ii) a liquid conditioning agent effective to render the surfaces of said particles hydrophobic, whereby to form a two-phase liquid system containing said particles in suspension,

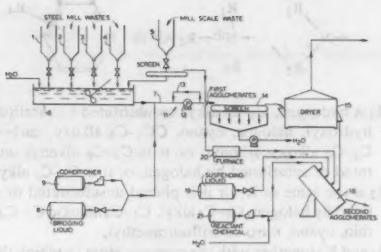
c. agitating the two-phase liquid system to effect repeated collisions of said particles and thereby forming in said system a dispersion of first, relatively small size agglomerates in said first hydrophobic organic liquid, said first agglomerates consisting essentially of agglomerates of said steel mill waste particles,

d. discontinuing said agitation and separating said first agglomerates from water, said first hydrophobic organic liquid and said conditioning agent,

e. then forming a second suspension of said first agglomerates in a second hydrophobic organic liquid which is immiscible with water,

f. adding to said second suspension an aqueous solution of a chemical reactive with iron to form a solid reaction product capable of binding together said first agglomerates, whereby to form a second two-phase liquid system containing said first agglomerates in suspension,

g. agitating said second two-phase liquid system to effect repeated collisions of said first agglomerates and thereby forming in said system a dispersion of second, relatively large size agglomerates, said second agglomerates consisting essentially of agglomerates of said first, relatively small size agglomerates, and simultaneously effecting a chemical reaction between said chemical and iron present in said particles whereby to form said solid reaction product which binds together said first agglomerates to form said second agglomerates,




h. discontinuing the agitation and recovering said second agglomerates substantially free of water and said second hydrophobic organic liquid.

10. A process for forming agglomerates from particles of iron-containing steel mill waste having a particle size of less than 10 mesh size, which comprises the steps of:

a. forming a pumpable slurry containing up to 25 wt. % of said steel mill waste particles suspended in water,

b. adding to said slurry (i) from 3 to 15 wt. %, based on the weight of said slurry, of a first hydrophobic organic liquid which is immiscible with water and (ii) from 0.1 to 5 wt. %, based on the weight of said slurry, of a liquid conditioning agent effective to render the surfaces of said particles hydrophobic, whereby to form a two-phase liquid system containing said particles in suspension,

c. agitating the two-phase liquid system to displace the water from the surfaces of said particles and to effect repeated collisions of said particles and thereby forming in said system a dispersion of first, relatively small size agglomerates in said first hydrophobic organic liquid, said first agglomerates having a particle size of from about 1/64 to ½ inch and consisting essentially of agglomerates of said steel mill waste particles in which said particles are connected together by liquid bridges of said hydrophobic organic liquid,

d. discontinuing said agitation, removing freely drainable water from said first agglomerates and then drying said agglomerates to remove residual water, said first hydrophobic organic liquid and said conditioning agent

whereby to obtain said first agglomerates in substantially dry condition,

e. then feeding said substantially dry first agglomerates and a second hydrophobic organic liquid which is immiscible with water into an agglomerator and mixing same therein to form a second suspension of said first agglomerates in said second hydrophobic organic liquid,

f. adding to said second suspension from 5 to 15 wt. %, based on the weight of said first agglomerates, of steel mill scale particles having a particle size of greater than about ¼ inch, as a nucleating agent, and also adding to said second suspension an aqueous solution of a chemical reactive with iron to form a solid reaction product capable of binding together said first agglomerates, whereby to form a second two-phase liquid system containing said first agglomerates in suspension,

g. agitating said second two-phase liquid system to effect repeated collisions of said first agglomerates and thereby forming in said system a dispersion of second, relatively large size agglomerates, said second agglomerates consisting essentially of agglomerates of said first, relatively small size agglomerates, and simultaneously effecting a chemical reaction between said chemical and iron present in said particles whereby to form said solid reaction product which binds together said first agglomerates to form said second agglomerates,

h. discontinuing the agitation, removing freely drainable liquid from said second agglomerates and then drying said second agglomerates and thereby recovering said second agglomerates substantially free of water and said second hydrophobic organic liquid.

---

**4,213,780**

## METHOD OF INTRODUCING CALCIUM AND CALCIUM ALLOYS INTO A VESSEL OF MOLTEN METAL

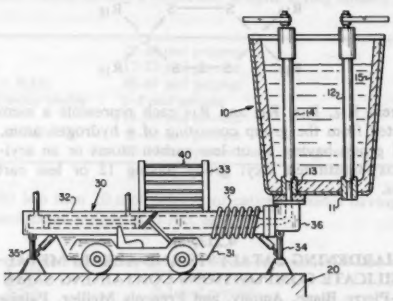
**Eldon D. Miller, Zelienople, Pa., assignor to Lava Crucible Refractories Co., Pittsburgh, Pa.**

**Filed Jul. 12, 1978, Ser. No. 924,080**

**The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.**

**Int. Cl.² C21C 7/02**

**U.S. Cl. 75—58** **7 Claims**




1. A method of treating molten metals comprising steps for: heating and extruding into a lower portion of a vessel containing molten metal, a composition comprising calcium metal and sodium metal, said composition being heated prior to entering the vessel to a temperature above the melting point of sodium and below the melting point of calcium, said sodium being present from about one-half percent by weight to about fourteen percent by weight of the composition in amounts and with volume distribution such that upon entering the molten metal, the immediately melted and vaporized sodium aids the dispersion of the calcium within the molten metal.

**4,213,781**

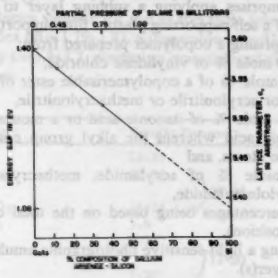
## DEPOSITION OF SOLID SEMICONDUCTOR COMPOSITIONS AND NOVEL SEMICONDUCTOR MATERIALS

**Alexander J. Noreika, and Maurice H. Francombe, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 602,493, Aug. 6, 1975, abandoned, which is a division of Ser. No. 381,653, Jul. 23, 1973, Pat. No. 3,979,271. This application Nov. 20, 1978, Ser. No. 962,344**

**Int. Cl.² C01C 15/00; B44D 1/02; H01L 7/36**

**U.S. Cl. 75—134 P** **19 Claims**




1. A binary semiconductor composition having the formula $(A)_{1-x}(B)_x$ where A is Group IIIa–Va conductor compound selected from the group consisting of BN, AlN, GaN, InN, BP, AlP, GaP, InP, AlAs, InAs and AlSb, B is a group IVa element selected from the group consisting of Si, Ge and Sn, and x is a number greater than about 0.01 such that $x+(1-x)=1$.

---

**4,213,782**

## PROCESS FOR REMOVAL OF SILVER FROM PHOTOGRAPHIC FILM

**Richard E. Kremp, 4220 Swanson La., Reno, Nev. 89502, and Fred N. Vandeman, 1617 Oakhurst Ave., Reno, Nev. 89507**

**Filed Feb. 3, 1977, Ser. No. 765,215**

**Int. Cl.² G03C 5/26**

**U.S. Cl. 430—432** **4 Claims**

1. A process for reducing the density of overexposed radiographic film having two emulsion sides, by removing silver from one side of said film, comprising:

placing a suitable barrier on one emulsion side of said radiographic film;

transporting the film into a reagent tank containing hypochlorite solution;

maintaining the film in said hypochlorite solution for a predetermined length of time;

collecting the precipitated silver chloride; washing the treated film, and drying the treated film; and removing said barrier.

---

**4,213,783**

## PHOTOGRAPHIC FILM SUBBING LAYER COMPRISING VINYLIDENE CHLORIDE AND ITACONIC ACID OR ESTER COPOLYMER

**Alan H. Cook, Manningtree, England, assignor to Bexford Limited, London, England**

**Filed Oct. 4, 1976, Ser. No. 728,918**

**Claims priority, application United Kingdom, Oct. 13, 1975, 41838/75**

**Int. Cl.² G03C 1/80**

**U.S. Cl. 430—533** **15 Claims**

1. A photographic film which comprises a self-supporting plastics film support, a subbing layer of a copolymer of vinylidene chloride applied to one or both surfaces of the film and a light-sensitive photographic emulsion layer applied over the

subbing layer(s), wherein the subbing layer(s) comprise a copolymer prepared from:

75 to 90 mole % of vinylidene chloride,

2 to 16 mole % of a copolymerisable ester of a carboxylic acid, or acrylonitrile or methacrylonitrile,

0.5 to 5 mole % of itaconic acid or a monoalkyl ester of itaconic acid wherein the alkyl group contains 1 to 4 carbon atoms, and

3 to 8 mole % of acrylamide, methacrylamide or N-methylolacrylamide,

(mole percentages being based on the total comonomeric composition).

13. A process for the production of a photographic film which comprises applying a subbing layer to one or both surfaces of a self-supporting plastics film support, said subbing layer comprising a copolymer prepared from:

75 to 90 mole % of vinylidene chloride,

2 to 16 mole % of a copolymerisable ester of a carboxylic acid, or acrylonitrile or methacrylonitrile,

0.5 to 5 mole % of itaconic acid or a monoalkyl ester of itaconic acid wherein the alkyl group contains 1 to 4 carbon atoms, and

3 to8 mole % of acrylamide, methacrylamide or N-methylolacrylamide,

(mole percentages being based on the total comonomeric composition),

and applying a light-sensitive photographic emulsion over the subbing layer(s).

---

**4,213,784**

## PROCESS FOR PRODUCING HEAT DEVELOPABLE LIGHT-SENSITIVE COMPOSITIONS AND ELEMENTS

**Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan**

**Continuation of Ser. No. 625,622, Oct. 24, 1975, abandoned. This application Jul. 3, 1978, Ser. No. 921,541**

**Claims priority, application Japan, Apr. 15, 1971, 46-45656; Oct. 24, 1974, 49-122902; Dec. 13, 1974, 49-143178; Jan. 31, 1975, 50-23074; Jul. 1, 1975, 50-81181**

**Int. Cl.[2] G03C *1/02*; C07F *1/10* C 11C 1/100**

**U.S. Cl. 430—616** **66 Claims**

1. In a process for producing an unexposed, coatable thermally developable light-sensitive composition of improved sensitivity which process comprises heating a composition containing an organic silver salt and a light-sensitive silver halide and after the completion of said heating adding a reducing agent, the improvement wherein a sulfur-containing compound is added to the organic silver salt and the light-sensitive silver halide and the sulfur-containing compound, organic silver salt and light-sensitive silver halide are heated at about 30° C. to about 70° C. for about 5 minutes to about 300 minutes, at which temperature said improved sensitivity is obtained, which sulfur-containing compound comprises at least one labile sulfur atom and forms silver sulfide upon reaction with the organic silver salt or the silver halide, wherein said sulfur-containing compound is represented by one of the following general formulae:

$$M^{I}S_2O_3$$

or

$$M^{II}S_2O_3$$

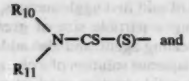
wherein $MI^{I}$ represents a monovalent cation and $M^{II}$ represents a divalent cation;

$$R_2—CS—NR_1R_3$$

wherein $R_1$ represents a hydrogen atom, an alkyl group, a carboxy- or aryl-substituted alkyl group, an alkenyl group, an aryl group, an alkyl-, carboxy- or carboxyalkyl substituted aryl group or an acyl group wherein said group or $R_1$ contains 12 or less carbon atoms; $R_2$ is a group selected from the class consisting of those represented by the following general formulae:

$$R_4R_5N—,$$

$$R_6R_7N—CS—NR_8—NR_9—,$$

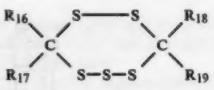


and

$$R_{12}R_{13}C{=}N_{14}—$$

wherein $R_4$ to $R_{14}$ are the same as defined for $R_1$ and n represents an integer of 1 to 3; and $R_3$ is the same as defined for $R_1$;

wherein $Z^1$ represents the atoms necessary to form a 5- or 6-membered heterocyclic ring, which heterocyclic ring may fuse with an aromatic ring, and which heterocyclic ring can be substituted with a substituent having 24 or less carbon atoms selected from the group consisting of an alkyl group, an aryl-substituted alkyl group, a carboxy-substituted alkyl group, an alkylidene group, an alkyl-substituted alkylidene group, a carboxy-substituted alkylidene group, a carboxyalkyl-substituted alkylidene group, an aryl group, an alkyl-substituted aryl group, a carboxy-substituted aryl group, a carboxyalkyl-substituted aryl group, an arylidene group, an alkyl-substituted arylidene group, a carboxy-substituted arylidene group and a carboxyalkyl-substituted arylidene group, and $R_{15}$ represents a hydrogen atom, an alkyl group, a carboxy- or aryl-substituted alkyl group, an alkenyl group, an aryl group or an alkyl-, carboxy- or carboxyalkyl-substituted aryl group wherein said group for $R_{15}$ contains 12 or less carbon atoms; and



wherein $R_{16}$, $R_{17}$, $R_{18}$ and $R_{19}$ each represents a member selected from the group consisting of a hydrogen atom, an alkyl group having 12 or less carbon atoms or an aryl- or carboxy-substituted alkyl group having 12 or less carbon atoms.

---

**4,213,785**

## HARDENING CATALYSTS AND ALKALI METAL SILICATE COMPOSITIONS CONTAINING SAME

**Jean-Pierre Blanc, Antony, and Francois Meiller, Palaiseau, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Apr. 28, 1978, Ser. No. 901,098**

**Claims priority, application France, May 2, 1977, 77 13177**

**Int. Cl.[2] B28B *7/34***

**U.S. Cl. 106—38.35** **15 Claims**

1. A composition of matter for hardening aqueous alkali metal silicate solutions consisting essentially of a mixture of an alkylene carbonate having 2 to 10 carbon atoms in the alkylene radical and a methyl ester of an organic acid which is selected from the group consisting of a methylester of a monocarboxylic acid containing 1 to 6 carbon atoms and a dimethylester of a dicarboxylic acid containing 3 to 10 carbon atoms, in a

weight ratio of 4 to 30 parts by weight of ester to 70 to 96 parts by weight of carbonate.

10. In a method for producing foundry molds and foundry cores, comprising mixing sand, an aqueous solution of an alkali metal silicate, and a hardening catalyst, the improvement comprising including in the mixture, as said hardening catalyst, a sufficient quantity of a mixture of an alkylene carbonate having 2 to 10 carbon atoms in the alkylene radical and a methyl ester of an organic acid which is selected from the group consisting of a methylester of a monocarboxylic acid containing 1 to 6 carbon atoms and a dimethylester of a dicarboxylic acid containing 3 to 10 carbon atoms, in a weight ratio of 4 to 30 parts by weight of ester to 70 to 96 parts by weight of carbonate, and then shaping the mix and allowing the shaped mix to set.

---

**4,213,786**

## LIGHTWEIGHT, HIGH REFRACTIVE INDEX GLASSES FOR SPECTACLE LENSES

**Marga Faulstich, Mainz; Volkmar Geiler, Mainz-Mombach, and Georg Gliemeroth, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to JENAer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany**

**Filed Jun. 5, 1979, Ser. No. 45,612**

**Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824891**

**Int. Cl.**[2] **C03C** *3/08, 3/10*

**U.S. Cl. 106—47 Q** **4 Claims**

1. A glass for spectacle lenses having a refractive index nd of 1.77–1.81, a dispersion nd of 30.4–34.4 a specific gravity s of 3.4–3.8 and a thermal expansion coefficient $\alpha \times 10^7$ at 20°–200° C. of ≦100, said glass consisting essentially of:

(a) more than 80 mol percent of mono and polyvalent cationic oxides having a molecular weight ≦100, namely

| | |
|---|---|
| $SiO_2$ | 22–30 mol percent |
| $B_2O_3$ | 17–23 mol percent |
| $SiO_2 + B_2O_3$ | 40–49 mol percent |
| Alkali metal oxides | 0–8 mol percent |
| CaO | 12–20 mol percent |
| MgO + CaO | 12–22 mol percent |
| $TiO_2$ | 17–24 mol percent; and correspondingly |

(b) less than 20 mol percent of cationic oxides having a molecular weight of >100, namely

| | | |
|---|---|---|
| $La_2O_3$ | 4–8 mol percent | |
| $P_2O_5$ | 0–1 mol percent | |
| BaO | 0–5 mol percent | |
| SrO | 3–10 mol percent | |
| BaO + SrO | 5–10 mol percent | |
| PbO | 0–2 mol percent | |
| $Al_2O_3$ | 0–1 mol percent | |
| $ZrO_2$ | 0–2 mol percent | |
| $Nb_2O_5$ | 0–1.5 mol percent | 0–2 |
| $Ta_2O_5$ | 0–1.5 mol percent | |
| $WO_3$ | 0–0.5 mol percent | |

said glass further having no pronounced tendency toward crystallization in a viscosity range of >200 poises as determined by the magnitude of the crystal growth speed and the crystallization temperature range in relation to the viscosity.

---

**4,213,787**

## HIGH REFRACTIVE INDEX GLASSES OF LIMITED SPECIFIC GRAVITY FOR DISTANCE AND NEAR VISION SPECTACLE LENSES

**Marga Faulstich, Mainz; Volkmar Geiler, Mainz-Mombach, and Georg Gliemeroth, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to JENAer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany**

**Filed Jun. 5, 1979, Ser. No. 45,613**

**Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824982**

**Int. Cl.**[2] **C03C** *3/04, 3/08, 3/10*

**U.S. Cl. 106—47 Q** **2 Claims**

1. Optical glasses suitable for use as spectacle lenses having a refractive index nd=1.79–1.81, a dispersion vd=31–29 and a specific gravity s=3.4–3.7, consisting essentially of the following composition:

| Oxides | Weight Percent | |
|---|---|---|
| $SiO_2$ | 25–35 | |
| $TiO_2$ | 10–15 | 28–35 |
| $Nb_2O_5$ | 18–24 | |
| $ZrO_2$ | 3–9 | |
| SrO | 0–7 | 12–20 |
| BaO | 7–20 | |
| $B_2O_3$ | 0–7 | |
| $Li_20$ | 5–8 | |
| $Na_2O$ | 0–3 | 5–9 |
| $K_2O$ | 0–2 | |
| MgO | 0–2 | 0–5 |
| CaO | 0–5 | |
| ZnO | 0–4 | |
| PbO | 0–3 | |
| $Al_2O_3$ | 0–2 | |
| $La_2O_3$ | 0–5 | |
| $Ta_2O_5$ | 0–4 | |
| $Gd_2O_3$, $Y_2O_3$, $Bi_2O_3$, $WO_3$ refining agent | 0–3; and 0.2–1, | |

said glasses having high crystallization stability as determined by the magnitude of crystal growth speed and the crystallization temperature range in relation to the viscosity in order to permit continuous production of said lenses.

---

**4,213,788**

## FLUORIDE AND PHOSPHATE CONTAINING OPTICAL GLASS

**Kouzi Kamiyama, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Mar. 12, 1979, Ser. No. 19,800**

**Claims priority, application Japan, Mar. 30, 1978, 53-37211**

**Int. Cl.**[2] **C03C** *3/16, 3/18*

**U.S. Cl. 106—47 Q** **6 Claims**

1. An optical glass having a refractive index ($\eta$d) of 1.47 to 1.53 and an Abbe's number $\nu$d of 77 and 85 and consisting essentially of the following composition:

| Component | Mole % |
|---|---|
| $Al(PO_3)_3$ | 8–11 |
| $MPO_3$ | 0.5–5 |
| $BaF_2$ | 5–25 |
| $SrF_2$ | 10–35 |
| $CaF_2$ | 5–30 |
| $MgF_2$ | 5–20 |
| $AlF_3$ | 13–30 |
| $LaF_3 + YF_3$ | 0–10 |

wherein the mole ratio of fluorine to phosphorus (F/P) is 6.5 or less, and M represents at least one of Li, Na or K.

4,213,789

## GLASS FORMING COMPOUND AND BRICK MADE THEREWITH

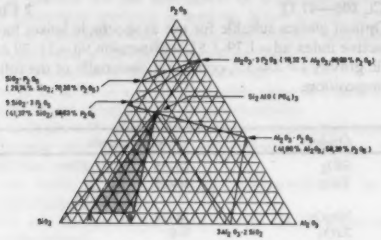
Peter Bartha, Bovenden, and Alexander Tutsek, Göttingen, both of Fed. Rep. of Germany, assignors to Refratechnik GmbH, Göttingen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,751

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754190

Int. Cl.² C03C 3/04

U.S. Cl. 106—52 4 Claims



1. A phosphate glass in the $Al_2O_3$—$SiO_2$—$P_2O_5$ system characterized by having the following composition on a 100 weight percent total glass weight basis:

14.00 weight percent $Al_2O_3$

32.93 weight percent $SiO_2$

53.02 weight percent $P_2O_5$,

by having a formula in its melted glass phase of $Si_2AlO(PO_4)_3$ or of $4SiO_2.Al_2O_3.3P_2O_5$ and by being compatible with $SiO_2$-phases selected from the group consisting of cristobalite, tridymite, and mullite.

---

4,213,790

## PROCESS FOR THE PRODUCTION OF CEMENT IN A FLUIDIZED BED

Klaus Bauer, Oelde; Wolf Goldmann, Beckum; Horst Kretzer, Beckum; Heinrich Weber, Beckum; Rüdiger Beyer, Bad Waldliesborn; Wilfried Kreft, Ennigerloh; Frank Schaberg; Rudolf Weber, both of Oelde; Herbert Schmelter, Ennigerloh; Horst Ritzmann, Enniger; Erich Schnieder, Ahlen, and Georg Schepers, Ennigerloh, all of Fed. Rep. of Germany, assignors to Polysius AG, Beckum, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,366

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735084; Aug. 4, 1977, 2735140; May 23, 1978, 2822377; May 23, 1978, 2822395; May 23, 1978, 2822419

Int. Cl.² C04B 7/44

U.S. Cl. 106—100 17 Claims

1. In a process of producing cement by calcining preheated powder-form raw material in a fluidised bed into which fuel, preheated air, and a recycled fraction of previously calcined raw material are introduced, and cooling material discharged from such bed by a stream of cooling air in a cooling zone, the improvement comprising:

(a) precalcining said raw material prior to its introduction to said fluidised bed to a deacidification level of at least 40%;

(b) passing calcined material downwards from the fluidised bed into a packed bed of material forming the cooling zone; and

(c) introducing part of the cooling air stream into the fluidised bed from below and another part from the side in such proportions as to maintain a substantially constant intersticial ratio between the upper and lower regions of said fluidised bed.

4,213,791

## PROCESS FOR PRODUCING PORTLAND AND OTHER HYDRAULIC CEMENTS

Eddie K. Wilson, Sr., 5877 Essex Ct. - Apartment 2, Memphis, Tenn. 38138

Continuation-in-part of Ser. No. 690,510, May 27, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,599

Int. Cl.² C04B 7/46

U.S. Cl. 106—100 15 Claims

1. A process for producing portland cement or other hydraulic cements, said process comprising: maintaining in an electric furnace a melt which has the chemical constituency of the desired hydraulic cement; introducing a molten material into the melt; introducing a solid material into the melt with the solid material being in a nonpulverulent condition; mixing the solid and molten materials within the melt by currents generated within the melt by the furnace; allowing the molten material to chemically combine with the solid material within the melt such as to maintain the chemical constituency of the melt at that for the desired hydraulic cement; withdrawing the melt from the furnace; and cooling the withdrawn melt to a solid that has the properties and chemistry of the desired cement.

---

4,213,792

## COATING SOLUTION FOR APPLYING TENSIONING COATINGS TO ELECTRICAL STEEL STRIP

Edmondo Marianeschi, Terni, and Paolo Marini, Rome, both of Italy, assignors to Centro Sperimentale Metallurgico S.p.A. and Terni-Societe per l'Industria e l'Elettricita S.p.A., both of Rome, Italy

Filed Feb. 24, 1978, Ser. No. 880,983

Claims priority, application Italy, Mar. 9, 1977, 48382 A/77

Int. Cl.² C09K 3/00; C23F 7/08

U.S. Cl. 106—286.6 1 Claim

1. Coating solution for forming on electrical steel strips an electrical insulation coating having a low coefficient of thermal expansion, containing on a dry weight basis for every 100 parts by weight of phosphoric acid, calculated at $P_2O_5$, from 10 to 35 parts by weight of $Ca^{2+}$ ions, calculated as CaO, up to 30 parts by weight of $Cr^{6+}$ ions, calculated as $CrO_3$, an effective amount up to 20 parts by weight of $Mg^{2+}$ ions, calculated as MgO, said amount being effective to improve the quality and evenness of the coating as compared to a coating lacking said amount, from 70 to 200 parts by dry weight of colloidal $SiO_2$, the value of the molar ratio

$$R=(CaO+MgO)/(P_2O_5+CrO_3)$$

being from 0.7 to 0.9, and from 40 to 200 parts by weight of water for every 100 parts of $P_2O_5$.

---

4,213,793

## PROCESS FOR DESULFURIZATION OF COAL AND ORES

Arthur E. Starbuck, P.O. Box 132, Clio, Calif. 96106

Filed Mar. 2, 1978, Ser. No. 882,866

Int. Cl.² C09K 3/00; C01B 17/08

U.S. Cl. 106—286.8 26 Claims

1. A process for desulfurizing ores containing sulfur comprising the steps of:

a. crushing ore containing sulfur to a particle consistency;

b. feeding the crushed ore to a heated continuous-flow processor;

c. introducing pre-heated sulfur dissolving solvent into said processor with the crushed ore;

d. concurrently mixing and force conveying the crushed ore and solvent by augering in the continuous flow processor at an elevated temperature in which sulfur is dissolvable and is dissolved in a heated sulfur-solvent solution with suspended particles and a remaining ore, the processor being oriented for about horizontal augering;

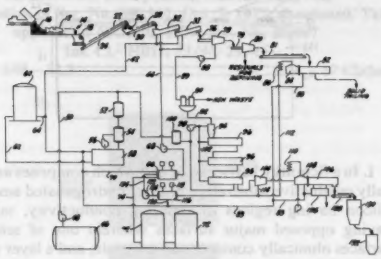
e. separating the sulfur-solvent solution with suspended

particles from the remaining ore at an elevated temperature;

f. drying the separated, remaining ore by evaporating remaining solvent from the ore;

g. recovering solvent from the ore drying step by condensing the evaporated solvent;

h. concurrently crystalizing sulfur dissolved in the sulfur-solvent solution and force conveying the sulfur-solvent solution and crystalizing sulfur by augering in a continuous flow chilled processor wherein the sulfur-solvent solution and crystalizing sulfur are conveyed together in a



concurrent manner as a mixture in a continuous forward direction at controlled reduced temperatures as substantially the entire mixture progresses to a separate separating step, said crystalizing sulfur existing in part as a suspension and in part as a precipitate;

i. separating both crystalized suspension sulfur and crystalized precipitate sulfur from the solvent solution;

j. drying the separated crystalized sulfur by evaporating the solvent from the crystalized sulfur, wherein a fine crystal sulfur product is obtained;

k. recovering solvent from the crystalized sulfur drying step by condensing the evaporated solvent.

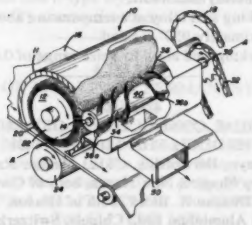
---

**4,213,794**

## CLEANING STATION

**David L. Wooding, and Robert W. Pletcher, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 892,719, Apr. 3, 1978, Pat. No. 4,172,303.**
**This application Mar. 12, 1979, Ser. No. 19,985**
**Int. Cl.² B08B 7/00**
**U.S. Cl. 134—6** **1 Claim**



1. A method of cleaning toner from the cleaning nap of a rotatable brush by a rotatable comb having bristles arranged to form at least one helical screw-type segment, which engage said cleaning brush nap comprising;

(a) rotating said comb and said cleaning brush in opposite directions; and

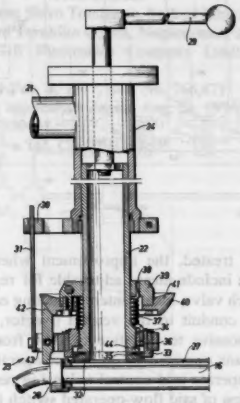
(b) selecting the angular velocity of said comb to be about twenty-five to fifty percent greater than the angular velocity of said cleaning brush.

**4,213,795**

## METHOD AND AN ARRANGEMENT FOR THE CLEANING AND STERILIZING OF A FILLER PIPE ON A PACKING MACHINE

**Ernst G. Ernstsson, Staffanstorp, and Hans O. I. Nantin, Trelleborg, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden**

**Filed Feb. 8, 1978, Ser. No. 876,105**
**Claims priority, application Sweden, Feb. 18, 1977, 7701818**
**Int. Cl.² B08B 5/00**
**U.S. Cl. 134—22 C** **4 Claims**



1. A method of cleaning and sterilizing a filler pipe on a packing machine of the type wherein a series of packing containers are filled through an orifice end of said filler pipe and said filler pipe includes a flange extending therefrom comprising:

providing a cleaning sleeve having a closed end, an open end, and a port which allows communication with the interior of said cleaning sleeve;

placing said cleaning sleeve in spaced concentric relationship to said filler pipe such that said closed end is in spaced relation to said orifice end of said filler pipe and said open end abuts said flange and is in sealing relationship therewith;

coupling a discharge tube to said cleaning sleeve in overlying sealing relationship to said port, said discharge tube including an annular ring having a frustoconical surface and a lever which is pivotably mounted to said discharge tube, one end of which cooperates with said frustoconical surface as said discharge tube is coupled to said sleeve to pivot said lever and cause a second end of said lever to engage said flange and secure the sleeve thereto; and thereafter

causing a cleaning fluid to flow sequentially through said filler pipe, into the space between said cleaning sleeve and said filler pipe, and into said discharge tube for a time sufficient to cleanse said filler pipe.

---

**4,213,796**

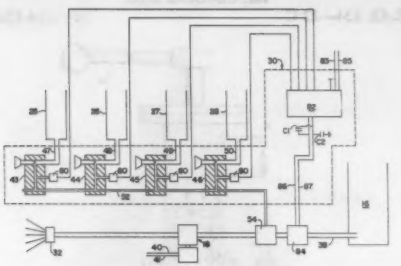
## MOBILE CLEANING UNIT

**Detmer B. Shaffer, Garrettsville, Ohio, assignor to Sparkle Wash, Inc., Chagrin Falls, Ohio**

**Filed Mar. 1, 1978, Ser. No. 882,167**
**Int. Cl.² B08B 3/02**
**U.S. Cl. 134—26** **5 Claims**

1. In a mobile washing and treating unit that includes a self propelled vehicle carrying a supply tank of liquid, an electric motor and pump unit for pumping liquid from the tank, a motor-generator unit for supplying electrical power to said electric motor, a plurality of containers for liquid additives to

be mixed with liquid pumped from said tank, a venturi injector in a first conduit between said tank and said motor and pump unit, solenoid operated control valves, one associated with an outlet from each of said containers, a second conduit common to said control valves and connected to said venturi injector, and an applicator connected through a flexible hose to the supply tank downstream from the venturi injector for applying liquid from the tank and from said containers to an object being



cleaned or treated, the improvement wherein said control valves each include means adjustable for regulating the flow through each valve, means interconnecting each valve to form a common conduit to the venturi injector, a flow-operated switch responsive to initiation of flow from said tank, and control means operated by said flow-operated switch to sequentially operate said control valves, in response to successive operation of said flow-operated switch to introduce fluid from the containers to the flow of fluid in said first conduit.

---

**4,213,797**

**RADIANT ENERGY TO ELECTRIC ENERGY CONVERTER**

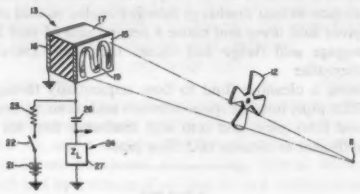
**Arden Sher, 108 Charles River Landing Rd., Williamsburg, Va. 23185**

**Continuation-in-part of Ser. No. 631,689, Nov. 13, 1975, Pat. No. 4,084,101. This application Mar. 23, 1978, Ser. No. 889,514**

**The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.**

**Int. Cl.[2] H01L *31/04***

**U.S. Cl. 136—89 SP** **59 Claims**



1. Apparatus for converting radiant energy into electric energy comprising a capacitor including an ionic dielectric and a pair of electrodes, means for causing said dielectric to be cyclically irradiated by said radiant energy, the properties of said dielectric being dominated by a dipole layer only on or near its surface, the capacitance of the capacitor being modulated in response to the cyclic irradiation, and means for connecting a load to the electrodes so the load is responsive to current derived from the capacitor in response to the capacitance modulation.

**4,213,798**

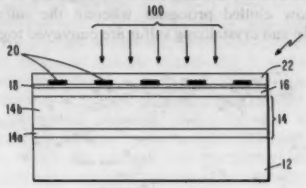
**TELLURIUM SCHOTTKY BARRIER CONTACT FOR AMORPHOUS SILICON SOLAR CELLS**

**Richard Williams, Princeton, and Yehuda Arie, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Apr. 27, 1979, Ser. No. 33,967**

**Int. Cl.[2] H01L *31/06***

**U.S. Cl. 136—89 SJ** **13 Claims**



1. In a Schottky barrier solar cell which comprises an electrically conductive substrate, a body of hydrogenated amorphous silicon having regions of differing conductivity, said body having opposed major surfaces wherein one of said major surfaces ohmically contacts said substrate, and a layer of material forming a Schottky barrier with said body contiguous to a major surface of said body opposite to said substrate, the improvement wherein the material which forms the Schottky barrier is a layer of tellurium.

---

**4,213,799**

**IMPROVING THE ELECTRICAL CONDUCTIVITY OF ALUMINUM ALLOYS THROUGH THE ADDITION OF MISCHMETAL**

**Mathur Raghavan, Norwalk; Stanley Shapiro, New Haven, both of Conn.; Ronald G. Hardy, and Duncan G. Block, both of Hixson, Tenn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Jun. 5, 1978, Ser. No. 912,205**

**Int. Cl.[2] C22F *1/04*; C22C *21/00***

**U.S. Cl. 148—2** **10 Claims**

2. A process of forming an aluminum base conductor wire having an electrical conductivity equivalent to commercial grade aluminum conductor wire, said process comprising the steps of:

(a) casting an aluminum base alloy consisting essentially of 0.04 to 1.0% by weight iron, 0.02 to 0.2% by weight silicon, 0.1 to 1.0% by weight copper, 0.001 to 0.2% by weight boron, 0.001 to 1.0% by weight mischmetal, balance essentially aluminum;

(b) hot working said alloy at a temperature above 400° F. up to approximately 950° F.; and

(c) cold working said alloy to a size range of 0.002 to 0.375".

---

**4,213,800**

**ELECTRICAL CONDUCTIVITY OF ALUMINUM ALLOYS THROUGH THE ADDITION OF YTTRIUM**

**William E. Mayo, Bartlesville, Okla.; Mathur Raghavan, Norwalk; Stanley Shapiro, New Haven, both of Conn.; Ronald G. Hardy, and Duncan G. Block, both of Hixson, Tenn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Jun. 12, 1978, Ser. No. 914,576**

**Int. Cl.[2] C22F *1/04*; C22C *21/00***

**U.S. Cl. 148—2** **10 Claims**

2. A process of forming an aluminum base conductor wire having an electrical conductivity equivalent to commercial grade aluminum conductor wire, said process comprising the steps of:

(a) casting an aluminum base alloy consisting essentially of 0.04 to 1.0% by weight iron, 0.02 to 0.2% by weight silicon, 0.1 to 1.0% by weight copper, 0.001 to 0.2% by

weight boron, 0.001 to 0.5% by weight yttrium, balance essentially aluminum;

(b) hot working said alloy at a temperature above 400° F. up to approximately 950° F.; and

(c) cold working said alloy to a size range of 0.002 to 0.375".

---

**4,213,801**

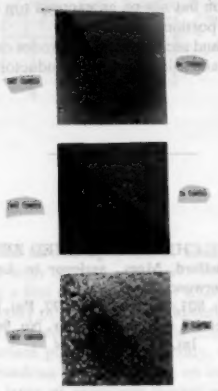
## OHMIC CONTACT OF N-GaAs TO ELECTRICAL CONDUCTIVE SUBSTRATES BY CONTROLLED GROWTH OF N-GAAS POLYCRYSTALLINE LAYERS

**Wilbur D. Johnston, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation of Ser. No. 840,161, Oct. 7, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,697**

**Int. Cl.² H01L *23/48, 29/46***

**U.S. Cl. 148—33.3** **17 Claims**



1. A supported semiconductor layer comprising an n-type layer of GaAs deposited on and forming an interface with an electrically conductive body characterized in that said layer of GaAs is a polycrystalline layer and said electrically conductive body comprises an electrically conductive substrate having deposited thereon an elemental layer of nominal thickness in the range of 1000 to 250 Å, wherein said elemental layer is substantially only one element of the group consisting essentially of Ge, Sn, and Si and wherein the resistance of said interface is less than 2 ohm-cm², the blocking voltage is less than 0.05 V and said n-type layer of GaAs covers at least 90% of said electrically conductive body.

---

**4,213,802**

## METHOD OF TREATING A PERMANENT MAGNET ALLOY

**Frederick Rothwarf, Toms River; Robert L. Bergner, Randolph; Herbert A. Leupold, Eatontown, and Arthur Tauber, Elberon, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 27, 1979, Ser. No. 33,940**

**Int. Cl.² H01F *1/02***

**U.S. Cl. 148—101** **4 Claims**

1. Method of lowering the reversible temperature coefficient of magnetization of a permanent magnet alloy said method consisting of heat treating the alloy in a noble gas atmosphere by the steps of

(a) heating the alloy at about 1200 degrees C. for 2 hours, (b) quenching the alloy in ice water, (c) heating the alloy at about 850 degrees C. for 2 hours, (d) lowering the temperature to about 700 degrees C. and heating for one hour (f) lowering the temperature to about 500 degrees C. and heating for one hour, (g) lowering the temperature to about 400 degrees C. and heating for four hours, and (h) lowering the temperature to about 280 degrees C. and heating for 12 hours.

---

**4,213,803**

## $R_2Co_{17}$ RARE TYPE-EARTH-COBALT, PERMANENT MAGNET MATERIAL AND PROCESS FOR PRODUCING THE SAME

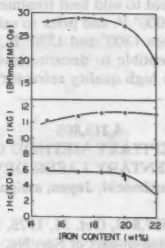
**Tetsuhito Yoneyama; Shiro Tomizawa, both of Ichikawa; Tetsuo Hori, Tokyo, and Teruhiko Ojima, Nagareyama, all of Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan**

**Filed Feb. 8, 1977, Ser. No. 766,671**

**Claims priority, application Japan, Aug. 31, 1976, 51-103919; Dec. 28, 1976, 51-159465**

**Int. Cl.² H01F *1/08***

**U.S. Cl. 148—102** **36 Claims**




1. A permanent magnet of $R_2Co_{17}$ type crystal structure consisting essentially of at least one rare earth metal in an amount of from 24 to 28% by weight, copper in an amount of from 5 to 12% by weight, a total combined amount of cobalt and iron from 55 to 70.8% by weight, said iron being present in an amount of up to 23% by weight, and at least two elements selected from the group consisting of niobium, vanadium, tantalum and zirconium in an amount of from 0.2 to 5% by weight, the amount of each of said elements being sufficient to create a substantial increase in the coercive force of said magnet compared to the coercive force of a magnet obtained by the inclusion of only one of said elements, said coercive force being increased about 0.5 KOe to 1.7 KOe, all percentages being based on the total weight of said magnet.

4. A permanent magnet of $R_2Co_{17}$ type crystal structure consisting essentially of at least one rare earth metal in an amount of from 24 to 28% by weight, copper in an amount of from 5 to 12% by weight, a total combined amount of cobalt and iron being from 55 to 70.8% by weight, said iron being present in an amount of up to 23% by weight and at least two elements selected from the group consisting of niobium, vanadium, tantalum and zirconium in an amount of from 0.2 to 5% by weight, the amount of each of said elements being sufficient to maintain the coercive force of said magnet at about the same level throughout said percentage range of said iron, said coercive force being about 7 KOe, all percentages being based on the total weight of said magnet.

7. A permanent magnet of $R_2Co_{17}$ type crystal structure consisting essentially of rare earth metal in an amount of from 24 to 28% by weight, copper in an amount of from 5 to 12% by weight, iron in an amount of from 15 to 20% by weight, a total combined amount of cobalt and iron being from 55 to 70.8% by weight, and a combination of zirconium and niobium in an amount of from 0.2 to 5% by weight, all percentages being based on the total weight of said magnet said magnet having an energy product of between about 20.6 and 28 MG-Oe.

**4,213,804**

## PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

**Amitava Datta, Gibsonia, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.**

**Filed Mar. 19, 1979, Ser. No. 21,513**
**Int. Cl.[2] H01F 1/04**
**U.S. Cl. 148—111** **10 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel to a thickness no greater than 0.020 inch; heat treating the cold rolled steel at a temperature between 1550° and 2000° F. in a hydrogen-bearing atmosphere; heat treating said steel at a temperature between 1300° and 1550° F. in a hydrogen-bearing atmosphere, said steel being decarburized to a carbon level below 0.005%, applying a refractory oxide coating to said steel; and final texture annealing said steel; the improvement comprising the step of removing at least 0.02 micron of surface from each side of said steel subsequent to said heat treatment at a temperature between 1550° and 2000° F. and prior to said heat treatment at a temperature between 1300° and 1550° F., thereby rendering said steel more susceptible to decarburization and the subsequent formation of a high quality refractory oxide coating.

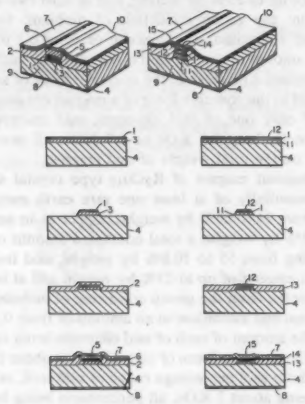
---

**4,213,805**

## LIQUID PHASE EPITAXY METHOD OF FORMING A FILIMENTARY LASER DEVICE

**Toshihisa Tsukada, Sekimachi, Japan, assignor to Hitachi, Ltd., Japan**

**Division of Ser. No. 627,863, Oct. 31, 1975, Pat. No. 4,121,177, which is a continuation-in-part of Ser. No. 474,023, May 28, 1974, abandoned. This application Apr. 11, 1978, Ser. No. 895,374**
**Claims priority, application Japan, May 28, 1973, 48-58643; May 28, 1973, 48-58644; Mar. 4, 1974, 49-24261**
**Int. Cl.[2] H01L 21/208, 21/302**
**U.S. Cl. 148—171** **21 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:

preparing a semiconductor body consisting of a III–V compound semiconductor material not including Al, having a major surface, and having a first conductivity type;

growing by liquid phase epitaxy a multi-layered semiconductor crystal on the major surface of said semiconductor body, said multi-layered semiconductor crystal including:

(i) a laser active layer having two opposite surfaces, a bottom surface which faces towards the major surface of said body and a top surface which faces away from the major surface of said body, and

(ii) an upper semiconductor layer of a second conductivity type, opposite to said first conductivity type, being a top layer of said multi-layered semiconductor crystal, consisting of a material including Al and having a broader band gap than that of the material of said laser active layer;

selectively etching said multi-layered semiconductor crystal so as to form a mesa-shaped portion of said multi-layered semiconductor crystal on a part of said major surface and to expose a remaining part of said major surface of said body;

growing by liquid phase epitaxy a side semiconductor layer, consisting of a material different from and having a broader band gap than that of said laser active layer, on the exposed major surface and side surfaces of said mesa-shaped portion but not on an exposed top surface of said mesa-shaped portion; and

depositing first and second metal electrodes on said semiconductor body and said upper semiconductor layer, respectively.

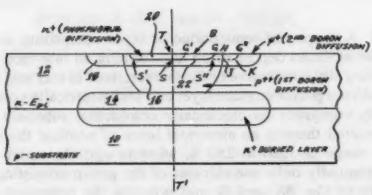
---

**4,213,806**

## FORMING AN IC CHIP WITH BURIED ZENER DIODE

**Wei K. Tsang, Bedford, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.**

**Division of Ser. No. 801,410, May 27, 1977, Pat. No. 4,136,349. This application Oct. 5, 1978, Ser. No. 948,673**
**Int. Cl.[2] H01L 7/44**
**U.S. Cl. 148—187** **6 Claims**



1. The method of making an IC chip with a buried Zener diode layer comprising the steps of:

diffusing p dopant into said chip through a first window having a predetermined lateral dimension in one direction to produce a first deep p layer having a second predetermined lateral surface dimension in said direction which is substantially larger than said first dimension;

diffusing p dopant into said chip to form a second p layer which is shallower than said first layer but which overlies said first layer and has side regions extending beyond said first layer in said one direction;

diffusing n dopant into said chip to form an n layer which is shallower than said second p layer and which is located with the surface boundaries of said first deep p layer, in said one direction; and

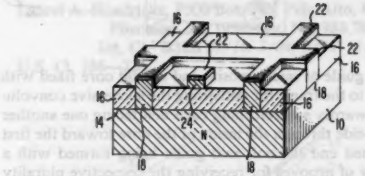
controlling the diffusion of said n layer to provide a lateral dimension in a second direction perpendicular to said one direction sufficient that the concentration of p dopant at the surface boundary of the n layer in said second direction is less than the concentration of p dopant at the buried horizontal interface between said n layer and the p dopant diffused in the first two diffusion steps.

4,213,807

## METHOD OF FABRICATING SEMICONDUCTOR DEVICES

Wojciech Rosnowski, Summit, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 803,722, Jun. 6, 1977, abandoned. This application Apr. 20, 1979, Ser. No. 32,027
Int. Cl.[2] H01L *21/225, 21/308*
U.S. Cl. 148—187 14 Claims



10. Method of fabricating a silicon semiconductor device comprising the steps of:

first forming a first masking layer of silicon oxide on a surface of a body of semiconductor material;

removing preselected portions of said first masking layer to expose surface portions of said body, other portions of said first masking layer remaining on said surface;

disposing a layer of aluminum dopant material over said other remaining portions of said first masking layer and said exposed surface portions, said aluminum having a diffusion coefficient with respect to said silicon oxide masking material which is large enough that allowing the aluminum to remain on said silicon oxide masking layer during diffusion of said aluminum into said semiconductor material would be detrimental to the intended device characteristics;

second forming a second masking layer over said layer of aluminum dopant material and selectively retaining said second masking layer to protect those portions of said layer of aluminum dopant material which overlie said exposed surface portions, while leaving the rest of said layer of aluminum unprotected;

first etching said unprotected portions of said layer of aluminum in an attempt to remove substantially all of said aluminum from said other remaining portions of said silicon oxide layer; and

second etching said other remaining portions of said silicon oxide layer with an etchant which selectively attacks said silicon oxide masking material, said second etching being carried out for a time which is long enough to remove any islands of aluminum on said other remaining portions of said silicon oxide masking layer which may not have been removed in said first etching step; and

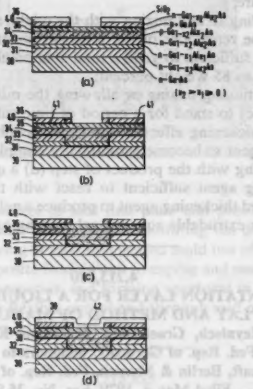
heating said body to a diffusion temperature for said aluminum dopant material in said silicon semiconductor body for a time sufficient to produce a P type diffused region of a desired depth in which the conductivity type of said diffused region is controlled by said aluminum dopant material and said diffused region is at least partially bounded by a PN junction with a portion of said semiconductor body having an N type conductivity.

4,213,808

## FABRICATION OF INJECTION LASERS UTILIZING EPITAXIAL GROWTH AND SELECTIVE DIFFUSION

George H. B. Thompson, Sawbridgeworth, and David F. Lovelace, Waltham Abbey, both of England, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,886
Claims priority, application United Kingdom, Apr. 1, 1977, 13957/77
Int. Cl.[2] H01L *21/225, 21/205, 33/00*
U.S. Cl. 148—188 6 Claims



1. A method of making a double heterostructure injection laser of III–V material, the method including the steps of:

forming by epitaxial growth a double heterostructure wherein an active layer of semiconductor material is sandwiched between upper and lower layers of higher bandgap semiconductor material, and wherein the upper layer is provided with a p-n junction dividing a lower part having the same conductivity type as that of the active layer and the lower layer from an upper part having the opposite conductivity type;

growing a layer of semiconductor material of the opposite conductivity than that of the upper part on upper layer, thereby producing a p-n junction which restricts current flow upon being reverse biased during the operation of the laser;

delineating a stripe on the upper surface of the semiconductive material; and

diffusing through said stripe a conductivity type determining dopant of the type opposite that of the active layer and of greater mobility than that used in the provision of the three layers of the heterostructure until the region of the p-n junction underlying the stripe is translated downwardly halting at the heterojunction between the active layer and the lower layer.

---

4,213,809

## WATER-RESISTANT EXTRUDABLE AQUEOUS GEL BLASTING AGENT AND SIMPLIFIED METHOD OF MANUFACTURE

Neil E. Gehrig, Westwood Hills, and Edwin G. Marhofer, Pittsburg, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 955,051, Oct. 26, 1978, abandoned. This application Apr. 18, 1979, Ser. No. 31,246
Int. Cl.[2] C06B *31/30*
U.S. Cl. 149—60 6 Claims

1. The method of manufacturing a water-resistant extrudable aqueous gel blasting agent comprising the steps:

(a) Mixing a stabilizing amount of finely divided water-solu-

ble hydroxy-substituted thickening agent with a substantial proportion, between one-tenth and three-fourths of the total amount of particulate solid ammonium nitrate to yield a substantially uniform mixture of particulate solids.

(b) Adding to and mixing with the mixture of particulate solids of step (a) at least 6 percent hexamethylenetetramine by weight of the total composition, sufficient nitric acid, between 2 percent and 5 percent by weight of the total composition to yield a pH between 3.5 and 6.0 in the total composition and a quantity of water sufficient to produce a water content of 10 to 13 percent by weight of the total composition, to yield a substantially uniform mixture;

(c) Adding to and mixing with the mixture obtained in step (b) the remainder of the solid particulate ammonium nitrate, sufficient to yield a total ammonium nitrate content of 75 to 85 weight percent;

(d) Continuing mixing or allowing the mixture obtained in step (c) to stand for a period of time sufficient to permit the thickening effect of the hydroxy-substituted thickening agent to become substantially complete and

(e) Mixing with the product of step (d) a quantity of crosslinking agent sufficient to react with the hydroxy-substituted thickening agent to produce a gelling effect, yielding an extrudable aqueous gel blasting agent.

---

**4,213,810**

## ORIENTATION LAYER FOR A LIQUID CRYSTAL DISPLAY AND METHOD OF MANUFACTURE

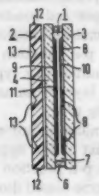
**Hinrich Heynisch, Graefelfing, and Hans Krueger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed May 4, 1979, Ser. No. 35,823**

**Claims priority, application Fed. Rep. of Germany, May 9, 1978, 2820245**

**Int. Cl.² C09K *3/34*; G02F *1/13***

**U.S. Cl. 156—73.1** **13 Claims**



1. In an improved method for the manufacture of an orientation layer which consists of parallel grooves introduced on a surface of a carrier plate by depositing a material under the influence of a flat, stationary wave field, for use in a liquid crystal display cell having two carrier plates which enclose a liquid crystal layer between them, the improvement of such method which comprises:

generating said wave field using ultrasonic waves.

---

**4,213,811**

## CONTINUOUSLY ADVANCING MANDREL

**Marcus A. Hall, Branford, Conn., and Thomas A. Kutnyak, Greenwood, S.C., assignors to Automation Industries, Inc., Greenwich, Conn.**

**Filed May 10, 1978, Ser. No. 903,772**

**Int. Cl.² B65H *8/00***

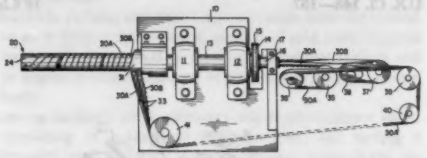
**U.S. Cl. 156—195** **12 Claims**

1. In a continuously advancing definite length mandrel device for making indefinite length articles, including a frame and a tubular mandrel core axially rotatable with respect to the frame and drive means for rotating the core, the improvement which comprises

(a) a plurality of closed-loop belts each having portions wrapped helically about said core in multiple lead fashion with their convolutions defining a mandrel surface, whereby as the core is rotated additional convolutions of said belts are drawn onto one end of said core;

(b) feeding means on said frame for urging all of said convolutions toward the opposite end of said core;

(c) means associated with said belt convolutions for maintaining all of said convolutions in a sliding fit about said core; and



(d) a belt guide at said opposite end of said core fixed with respect to the frame for collapsing the successive convolutions inwardly and returning each belt facing one another side-by-side through the inside of the core toward the first mentioned end thereof, said guide being formed with a plurality of grooves for receiving the respective plurality of belts, said grooves being of equal length along their centerlines.

---

**4,213,812**

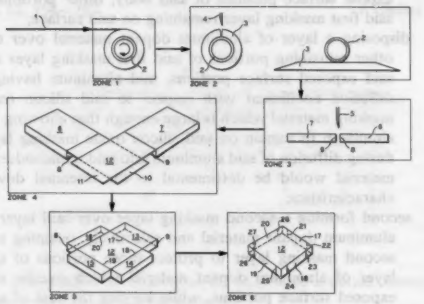
## PROCESS FOR PREPARING CROSSLAPPED FILM STRUCTURES

**Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 5, 1970, Ser. No. 16,743**

**Int. Cl.² B37B *7/08***

**U.S. Cl. 156—226** **6 Claims**



1. A process for preparing at least one structure comprised of layered, nonbonded, crosslapped film from at least two layered, nonbonded film laminates produced from a single sheet of film whereby said film is continuously introduced into a winding zone containing therein a rotating means, accumulating said film in wrapped layers on the periphery of said rotating means until a desired thickness of layered film is established thereon, transferring said rotating means containing thereon said layered film to a zone wherein said layered film is removed from said rotating means by severing said layered film in a plane from the outer layer of said layered film to the periphery of said rotating means to thus produce at least one blanket of layered film, transferring said blanket of layered film to a zone and therein severing said blanket of layered film to thus produce said two layered nonbonded film laminates; said process further comprising a placement step, a first rotation step, and a second rotation step; said placement step comprising placing in a crosslapping zone and in the same plane a first of said film laminates having a first fastened edge, and a second

of said film laminates having a second fastened edge such that said first fastened edge and said second fastened edge are adjacent and at an angle to each other; said first rotation step comprising rotating at least a first film ply of said first film laminate about said first fastened edge and placing said first film ply on said plane; said second rotation step comprising rotating at least a second film ply of said second film laminate about said second fastened edge and placing said second film ply on said plane overlapping said first film ply; said first and said second rotation steps being repeated in alternation until the desired number of film plies are placed in said structure.

---

**4,213,813**

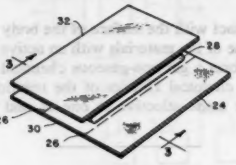
## SANITARY NAPKIN

**Laurel A. Hendricks, P.O. Box 943, Palo Alto, Calif. 94302**

**Filed Oct. 23, 1978, Ser. No. 953,782**

**Int. Cl.[2] B32B** *31/16, 3/04;* **A61F** *13/16*

**U.S. Cl. 156—226** **4 Claims**




1. A method of making a sanitary napkin comprising the steps of:

providing a rectangular sheet of thin absorbent fabric having a width equal to substantially thrice the desired width of the napkin and a length substantially the total desired length of said napkin including end tabs;

centering an absorbent pad in the central third of said fabric sheet, said pad having a width substantially equal to the desired width of said napkin and a length equal to the desired length of said napkin excluding end tabs;

providing a sheet of moisture barrier material over said pad and over one of said exposed thirds of said fabric sheet;

folding the uncovered third of said fabric sheet over the top of said pad and its covering moisture barrier;

folding the third of said fabric sheet and its covering moisture barrier over said uncovered third; and

sealing together all fabric and moisture barrier layers and sealing those layers extending beyond the ends of said pad into a unitary end tab at each end of said pad.

---

**4,213,814**

## INSULATION PLATE FORMATION

**Lambert Pasch, Nutheim, and Heinz Wagemann, Aachen, both of Fed. Rep. of Germany, assignors to Uniroyal A.G., Aachen, Fed. Rep. of Germany**

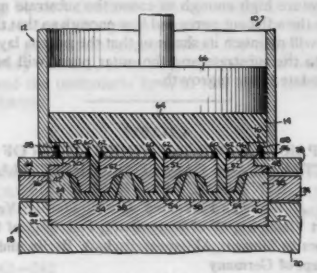
**Division of Ser. No. 499,347, Aug. 21, 1974, Pat. No. 3,961,014, which is a division of Ser. No. 316,165, Dec. 18, 1972, Pat. No. 3,859,024. This application Dec. 12, 1975, Ser. No. 640,126**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1971, 2164219**

**Int. Cl.[2] B29F** *1/06*

**U.S. Cl. 156—242** **7 Claims**

1. A method of fabricating an insulation plate to be interpositioned between an elastomeric stock injection unit and a heated mold having inlet apertures for elastomeric stock; said method comprising impregnating a first body of heat-resistant, flexible fibers with a thermosetting resin, and curing said resin so as to form the same and said fibers into a hardened flexible first plate; impregnating a second body of heat-resistant, flexible fibers with a thermosetting resin, and shaping the latter said resin and the associated fibers to form a second plate of lesser thickness and hardness than said first plate; superposing said plates upon one another; interposing the superposed plates between said heated mold and said injection unit; affixing said superposed plates to said injection unit; moving said heated mold and said injection unit into opposed, pressing engagement with said superposed plates such that said heated mold forms cured impressions in said second plate corresponding to the outlines of said apertures while said second plate cures at least



partially, vulcanizes to said first plate and presents with the latter a composite flexible unit constituting the desired insulation plate; moving at least said heated mold out of engagement with said composite flexible unit to expose and make accessible said cured impressions; and forming apertures in and through said composite flexible unit at and through said cured impressions formed in said second plate.

---

**4,213,815**

## CONTINUOUS PROCESS FOR PRODUCING, BY IRRADIATION, A MICROPOROUS RUBBER COMPOSITION SUITABLE FOR BATTERY SEPARATORS

**Bruce S. Goldberg, Clifton, and Mahendra Shah, Newark, both of N.J., assignors to Amerace Corporation, New York, N.Y.**

**Filed Jun. 16, 1978, Ser. No. 915,917**

**Int. Cl.[2] C08F** *8/00;* **B29C** *19/00*

**U.S. Cl. 156—244.11** **25 Claims**

1. In a process for producing microporous polymeric material, the improvement comprising:

compounding a sulfur free curable composition of a compound selected from the group consisting of curable natural rubber, polyisoprene, styrene-butadiene, nitrile-butadiene, and ethylene-propylene rubber, or a mixture of same with a curative for curing the composition by electron beam irradiation, said curative therefor being an ethylenically unsaturated curing agent of acrylate or methacrylate having more than one acrylate or methacrylate group present, or mixtures thereof, and rehydrated silica;

continuously forming a shape of said composition; and

continuously curing said formed shape by irradiation at an irradiation level of less than 10 megarads.

14. The process as defined in claim 1, wherein during said continuous forming of said shape the curable composition is extruded and in shaping to final form, backed with a sheet of an inert polymer, non-woven, heat-bonded web.

---

**4,213,816**

## METHOD FOR BONDING POROUS COATING TO RIGID STRUCTURAL MEMBER

**Harold B. Morris, Newnan, Ga., assignor to Glasrock Products, Inc., Fairburn, Ga.**

**Continuation-in-part of Ser. No. 764,952, Feb. 2, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,737**

**Int. Cl.[2] B29C** *19/00*

**U.S. Cl. 156—245** **11 Claims**

1. Method for bonding a layer of porous polymeric material to a rigid implantable portion of a prosthetic device, comprising the steps of (a) forming a substrate by coating the implant-

able portion with material which is chemically compatible with the porous polymeric material and which has a melt viscosity lower than that of the porous polymeric material, (b) covering the substrate with a porous polymeric material in powder form capable of forming said porous polymeric layer for forming a composite coating on the implantable portion, and (c) heating the substrate and porous polymeric material to a temperature high enough to cause the substrate material to flow into the adjacent pores and low enough so that the porous material will maintain its shape so that the porous layer will be bonded to the substrate and the outer pores will be open to accommodate tissue ingrowth.

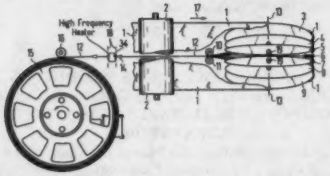
---

**4,213,817**

## APPARATUS FOR THE PRODUCTION OF AN ELECTRIC STACK CAPACITOR OF METALLIZED SYNTHETIC MATERIAL FILMS

**Friedrich J. Gaenge, Ferdinand Utner, Harald Vetter, and Gerhart Vilsmeier, all of Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Division of Ser. No. 815,217, Jul. 13, 1977, Pat. No. 4,128,926.**
**This application Jul. 27, 1978, Ser. No. 928,426**
**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634442**
**Int. Cl.[2] B31F *1/34***
**U.S. Cl. 156—474** **10 Claims**



1. A capacitor forming device for producing a stack capacitor formed from a synthetic material band with metal coatings therein, said band having longitudinal folds and being formed into a fold block, said device comprising: a deflection roller; a row of folding wheels inclined towards one another and arranged in a running direction of the band after the deflection roller; central axes of the folding wheels arranged to lie in one plane by providing a single curved axis member common to all folding wheels and substantially transverse to the running direction; a spacing of all the folding wheels from one another at a film inflow point of the folding wheels approximately corresponding with twice the width of the fold block to be produced; a spacing of the row of folding wheels at an outflow point of the synthetic material band being a smallest distance from one another relative to the spacing at the inflow position and consistent with folds formed in the band between adjacent folding wheels; a pair of contact pressure roller means arranged after an outflow point in the running direction of the band, said roller means further folding and pressing the folds together.

---

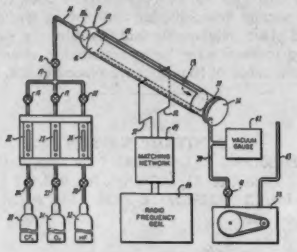
**4,213,818**

## SELECTIVE PLASMA VAPOR ETCHING PROCESS

**Kyle E. Lemons, San Jose; Richard C. Blish, II, Los Gatos, and Jan D. Reimer, Palo Alto, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.**

**Continuation of Ser. No. 828,943, Aug. 29, 1977, abandoned.**
**This application Jan. 4, 1979, Ser. No. 1,039**
**Int. Cl.[2] H01L *21/306*; C23F *1/02***
**U.S. Cl. 156—643** **14 Claims**

1. In a selective vapor etching process for performing operations on a body formed of at least two different materials which are exposed at one surface of the body and in which the body is disposed in a chamber having a pressure below atmosphere therein, creating by electrodeless electromagnetic discharge within the chamber a gas plasma having active species of atoms and molecules, and wherein said gas plasma consists essentially of a binary mixture of 5 to 95 mole percent sulfur hexafluoride and the balance helium, so that the gas plasma



comes into contact with the surface of the body to chemically react at least one of the materials with an active species in the gas plasma to form a gas-non-gaseous chemical reaction, and controlling the chemical kinetics of the reaction so that the reaction can be made selective to one of said two different materials.

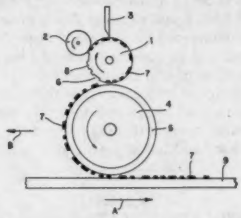
---

**4,213,819**

## METHOD OF PRODUCING LARGE-FORMAT EMBOSSING TOOLS

**Wilfried Werthmann, Krefeld, Fed. Rep. of Germany, assignor to Firma Standex International GmbH, Krefeld, Fed. Rep. of Germany**

**Filed Feb. 16, 1978, Ser. No. 878,432**
**Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706947**
**Int. Cl.[2] C23F *1/02***
**U.S. Cl. 156—660** **3 Claims**



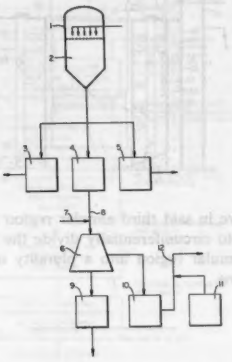
1. A method of making an embossing tool for the embossing of plates, sheets or foils, said method comprising the steps of:
(a) indirectly applying to a metal substrate of a large format press plate for a synthetic resin plate press a first layer of an etching resist in a predetermined pattern by applying a patterned layer of the resist by a patterned roll to a silicone-rubber surface of a transfer roll and then rolling the patterned layer onto said substrate with the silicone-rubber surface of the transfer roll;
(b) etching a surface of said substrate through said layer of resist to effect a first pattern etching of said surface; and
(c) repeating steps (a) and (b) in succession at least twice with application of a respective layer of resist to said substrate for each repetition out of total registry with an etch pattern previously produced in said surface of said substrate, the first of the etching operations being carried out to a depth of 80 to 100 microns, a second of the etching operations being carried out to a depth of 50 to 80 microns and a third etching operation being carried out to a lesser depth as low as 10 microns.

4,213,820

## TREATMENT OF EFFLUENTS IN A CHLORINE BASED PULP BLEACHING PLANT

Bengt G. Broddevall, Skoghall, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Dec. 9, 1976, Ser. No. 749,102
Claims priority, application United Kingdom, Mar. 18, 1976, 10990/76
Int. Cl.² D21C 11/00
U.S. Cl. 162—29 9 Claims



1. In a process for purifying a dark colored effluent of a chlorine based pulp mill bleaching plant, said effluent containing chlorine and colored lignin degradation product pollutants, said process comprising passing the effluent through a resin bed of an activated particulate, weakly basic anion exchange resin to retain said colored lignin degradation product pollutants in the resin bed until the resin has become saturated with said pollutants to a given degree, eluting the resin bed with an alkaline solution to release said pollutants therefrom, and disposing of the eluate, the improvement comprising separating the eluate released from the resin bed into fractions by color pattern, said fractions comprising a fore-cut (start fraction), an outer cut (end fraction) and a central cut, wherein the central cut comprises that portion of the eluate between about the first bed volume of eluate to about 1.8 to 2.4 bed volume of eluate, said central cut containing that portion of the eluate having the highest color concentration of any portion of the eluate and also containing a volume of eluate on either side of said portion of the eluate, and acidifying said central cut to a pH of less than about 2 to precipitate at least a majority of the total solids of the acidified effluent without precipitating solids in said fore-cut or said outer cut, separating the precipitate from the remainder of the central-cut, said remainder containing the majority of inorganic chlorine of said central cut, and disposing of said precipitate.

---

4,213,821

## PULPING WITH QUINONES AND HYDROQUINONES

Naphtali N. Vanderhoek, Doncaster; Peter F. Nelson, Kew, and Alan Farrington, Donvale, all of Australia, assignors to Australian Paper Manufacturers Limited, Victoria, Australia

Filed May 25, 1977, Ser. No. 800,566
Claims priority, application Australia, Jun. 2, 1976, PC6141; Sep. 23, 1976, PC7473; Dec. 13, 1976, PC8455
Int. Cl.² D21C 3/02, 3/22
U.S. Cl. 162—72 25 Claims

1. In a process for the delignification of lignocellulosic material wherein the lignocellulosic material is cooked with a neutral sulphite pulping liquor, the improvement comprising adding to the pulping liquor 0.001% to 10% by weight of an additive compound selected from the group consisting of anthraquinone, phenanthrenequinone, naphthoquinone, anthrone, anthrahydroquinone, naphthohydroquinone, phenanthrahydroquinone, the alkyl-, alkoxy-, hydroxy-, amino-, halo- or carboxy derivatives of said quinones or hydroquinones, the tautomeric form of said additive compounds and mixtures of said additive compounds.

14. In a process for the delignification of lignocellulosic material wherein the lignocellulosic material is cooked with an alkaline pulping liquor, the improvement comprising adding to the pulping liquor 0.001% to 10% by weight of a hydroquinone selected from the group consisting of 9, 10-anthrahydroquinone, phenanthrahydroquinone, the alkyl-, alkoxy-, halo-, hydroxy-, amino-, or carboxy-derivatives of said hydroquinones and the tautomeric form of said hydroquinones and mixtures thereof.

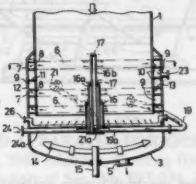
---

4,213,822

## APPARATUS FOR DISPLACEMENT WASHING OF FIBROUS MATERIAL SUSPENDED IN A LIQUID

Erik S. Eriksson, Rastorpsvägen 12, S-653 49 Karlstad, Sweden

Filed Oct. 12, 1978, Ser. No. 950,873
Int. Cl.² D21C 9/02
U.S. Cl. 162—242 7 Claims



1. Apparatus for displacement washing of fibrous material suspended in a liquid comprising:

(a) a vessel having a substantially symmetrical cross section about an axis of symmetry and having an axially spaced inlet and outlet for a fibrous material-liquid suspension,

(b) a plurality of means disposed substantially on or adjacent the axis of symmetry of the vessel for introducing washing liquid into the interior of the vessel to displace suspension liquid from the fibrous material in selected zones of said vessel,

(c) means including at least one member pervious to the suspension liquid and substantially impervious to the fibrous material defining, together with the outer wall of the vessel, axially spaced and peripherally extending washing chambers for receiving liquid displaced from the fibrous material in respective ones of said selected zones,

(d) means including at least one member impervious to the suspension liquid and to the fibrous material defining further chambers with the outer wall of said vessel, said further chambers being located above or beneath a respective washing chamber peripherally of said vessel,

(e) restriction means of fixed flow-through area for communication of a washing chamber with an associated further chamber, said restriction means being arranged to control the flow of suspension liquid from said washing chamber to said associated further chamber, whereby substantially uniform distribution of the washing liquid flow through the fibrous material at any given cross section transverse to the vessel axis is obtained,

(f) means for recycling washing liquid drawn off from selected ones of said zones to selected others of said zones, said means comprising, for each of said washing-liquid introducing means, a conduit which is stationarily arranged in said vessel and which forms part of a conduit system extending between said selected one of said zones to said selected other of said zones in communication therewith,

(g) means for preventing the buildup of fibrous material on said recycling conduits comprising a perforated pipe disposed immediately above each of said recycling conduits

for injecting liquid into the fibrous material located in the vicinity thereof to prevent said material from settling on said conduits, and

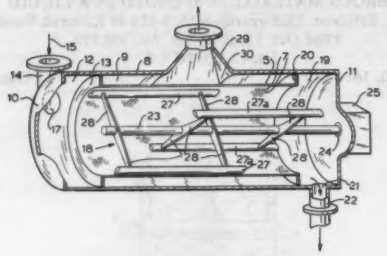
(h) a rotary agitator disposed just above the bottom of the vessel and below the recycling conduits for imparting rotary motion to the fibrous material to prevent fibrous material from settling at the bottom of the vessel.

---

## 4,213,823
## PAPER MAKING MACHINE SCREEN WITH STAGGERED FOILS

**Carl E. Wittig, Becket, and Raymond C. Vonderau, Lenox, both of Mass., assignors to Beloit Corporation, Beloit, Wis.**

**Filed Apr. 26, 1979, Ser. No. 33,730**
**Int. Cl.[2] D21D 5/02**
**U.S. Cl. 162—380** **7 Claims**



1. A paper making machine screen apparatus for processing stock flowing to a headbox comprising, in combination:

an elongate cylindrically tubular screen;

a housing enclosing said screen;

supply means for supplying stock slurry into said housing to flow through said screen;

stock accepting means including an outlet pipe for receiving stock from said screen;

discharge means for receiving material not passing through the screen;

axially extending foil means mounted to rotate relative to said screen for generating pressure pulsations to move acceptable slurry through said screen;

means for driving said foil means rotatably;

said foil means comprising a plurality of foils arranged to move in circumferential direction along an adjacent face of said screen in the rotation of said foil means;

and at least some of said foils being axially substantially shorter than said screen and being in circumferentially offset interdigitated relation to other of said foils;

whereby the frequency of pulsations is increased but the total amplitude of the pulsations in the outlet pipe is reduced as compared with an arrangement in which all foils extend substantially the full length of the screen.

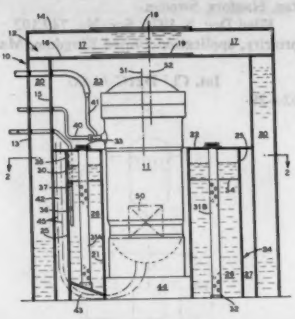
---

## 4,213,824
## NUCLEAR STEAM SYSTEM CONTAINMENT

**Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Jun. 23, 1977, Ser. No. 809,220**
**Int. Cl.[2] G21C 15/18**
**U.S. Cl. 176—38** **38 Claims**

1. An improved containment used for radiation shielding and pressure suppression comprising a dry well including a pressure vessel, a plurality of cocentric wall means, said plurality of cocentric wall means defining at least three annular regions about said dry well, a first annular region providing the containment used for radiation shielding, a second annular region which is substantially dry, a third annular region providing a wet well for relieving fluid pressure released from the pressure vessel into the dry well, and pipe connection means extending in the wet well from the dry well, a pool of liquid disposed to partially fill said third annular region, the upper and portion of the second and third annular regions having an enclosure, and a plurality of baffle plates extending vertically downward from



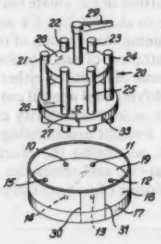
said enclosure in said third annular region into said pool of liquid so as to circumferentially divide the upper portion of said third annular region into a plurality of circumferential upper portions.

---

## 4,213,825
## APPARATUS FOR TESTING REACTIONS

**Rolf Saxholm, Box 3, 1362 Billingstad, Norway**

**Continuation-in-part of Ser. No. 502,107, Aug. 30, 1974, Pat. No. 3,981,776, which is a continuation-in-part of Ser. No. 156,738, Jun. 25, 1971, Pat. No. 3,843,450, which is a continuation-in-part of Ser. No. 705,539, Feb. 14, 1968, abandoned. This application Aug. 23, 1976, Ser. No. 716,684**
**The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.**
**Int. Cl.[2] C12K 1/00**
**U.S. Cl. 435—291** **12 Claims**

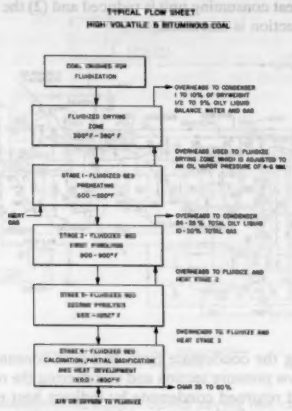


1. Apparatus for testing reactions comprising a support for a substrate capable of containing an agent, dispenser means for guiding and depositing a plurality of individual articles adapted for containing respective active constituents onto said substrate in spaced relation at pre-determined location, means for bringing said articles into contact with the substrate at a predetermined operative contact pressure, said constituents undergoing respective reaction with the agent of said substrate and producing detactable results, reader means for determining said detectable results at said predetermined locations, and means for releasably coupling and orienting the support respectively with the dispenser means to predetermine the locations of said articles on the substrate and with the reader means so that the position at which the reader means determines the said detectable results is also determined.

## 4,213,826
## FLUIDIZED COAL CARBONIZATION

Ralph T. Eddinger, Princeton Junction, and Louis D. Friedman, New Brunswick, both of N.J., assignors to Cogas Development Company, Princeton, N.J.

Filed Oct. 2, 1978, Ser. No. 947,369
Int. Cl.[2] C10B *49/10*
U.S. Cl. 201—31 3 Claims




1. In the multistage fluidized carbonization of coal to produce oil, gas and char wherein the coal is:

1. Heated in a first stage below its fusion temperature under oxygen free conditions in a first fluidized bed formed by passing an inert gasiform stream upwardly through the stage to maintain the coal in the fluidized state;
2. In at least a second stage passing the so-treated coal into at least one other fluidized bed which is fluidized by the gaseous overheads from the subsequent stages at a temperature above that of the first bed and below the fusion point of the solids fed to that stage, under oxygen-free conditions, for a time sufficient to remove nearly all of the volatiles from the coal condensable oily liquids, and
3. In a final stage passing the thus-treated coal into a final fluidized bed which is fluidized by an oxygen-containing gas at a still higher temperature, to substantially devolatilize the coal, the improvement of recovering sensible heat from the overheads of stage 1 comprising the steps (1) providing a fluidized drying zone to receive the particulate coal feed; (2) using the stage 1 overheads as the fluidizing atmosphere in step (1) to heat and dry the particulate coal feed while maintaining the vapor pressure of the oil in the drying zone at a value of under 10 mm; (3) conveying the dried coal to stage 1; and (4) recovering oil from the overheads of the fluidized drying zone.

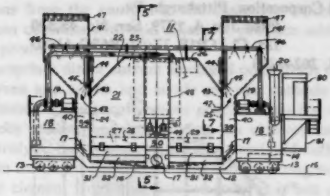
---

## 4,213,827
## METHOD AND APPARATUS FOR QUENCHING COKE

Albert Calderon, 1065 Melrose, Bowling Green, Ohio 43402

Filed Jan. 5, 1977, Ser. No. 757,074
The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.
Int. Cl.[2] C10B *33/00, 39/04, 39/14*
U.S. Cl. 201—39 5 Claims

4. A method of controlling pollutions during the discharge of coke from a coke oven having a pusher side and a coke discharge opening, said method comprising the steps of moving a carriage into alignment with the coke discharge opening, pushing a body of hot coke out of the discharge opening of the oven, guiding the coke pushed from the oven into a chamber supported on said carriage, quenching the coke by directing liquid at coke which is pushed into said chamber for dropping the temperature of the coke, confining steam and vapor generated during the dropping of the temperature of the coke in the chamber for building a positive pressure within the chamber, forcing the steam and vapors generated from the quenching of the coke out of the chamber through a venturi-like opening by



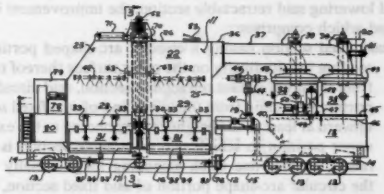
means of the positive pressure built up in the chamber, and spraying liquid at the gases forced through said venturi-like opening by the positive pressure in the chamber for cleaning the gases.

---

## 4,213,828
## METHOD AND APPARATUS FOR QUENCHING COKE

Albert Calderon, 1065 Melrose, Bowling Green, Ohio 43402

Continuation-in-part of Ser. No. 757,074, Jan. 5, 1977. This application Jun. 7, 1977, Ser. No. 804,364
The portion of the term of this patent subsequent to Feb. 22, 1996, has been disclaimed.
Int. Cl.[2] C10B *33/00, 39/04, 39/14*
U.S. Cl. 201—39 4 Claims



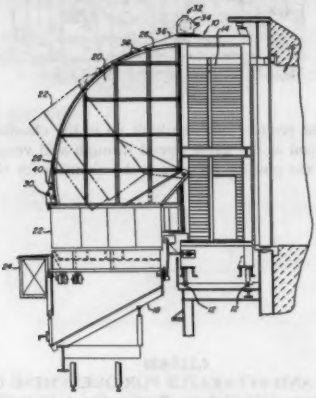
4. A method of controlling pollutions during the pushing of coke from a coke oven having a pusher side and a coke discharge opening, said method comprising the steps of providing a carriage having a chamber, moving the carriage into a selected position with respect to the coke oven to position the inlet of the chamber in alignment with the discharge opening of the coke oven, pushing coke through the discharge opening of the coke oven and into the chamber, directing fluid into the chamber for dropping the temperature of the coke in the chamber and for generating steam and vapors, confining steam and vapors generated from the quenching of coke within the chamber for creating and maintaining a positive pressure within the chamber and for forcing steam and vapors through a narrow opening having an inlet communicating with the chamber, providing a condenser on the carriage in the form of a receptacle for receiving and confining a body of fluid therein and having an inlet in fluid communication with the outlet side of the narrow opening, creating a slight negative draft in said condenser as coke is being pushed into the chamber, whereby steam forced out of said narrow opening is directed to said condenser, and directing fluid into the condenser at the steam and vapor in said condenser for condensing steam and vapor directed to the condenser.

4,213,829

## RETRACTABLE HOOD FOR TRANSFER OF COKE

Donald L. Friend, Olympia Fields, Ill.; John A. Grosko, West Mifflin Boro, and Richard B. Liniger, II, Cranberry Township, Butler County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 45,530
Int. Cl.[2] C01B *27/04;* B65G *11/00*
U.S. Cl. 202—263 6 Claims



1. In a hood for preventing escape of pollutants when transferring coke therethrough, said hood having a fixed section extending from an upper end to a lower end adjacent a container for receiving said coke, a retractable section pivotally attached to the lower end of said fixed section for movement concentrically over a portion thereof, and means for raising and lowering said retractable section, the improvement in said hood which comprises:

said fixed section having a circular arc-shaped portion extending longitudinally on the outer surface thereof remote from the pivot of said retractable section, said circular arc portion extending from the lower end of said fixed section upward at least to the height corresponding to the extreme upper position to which said retractable section is to be raised, at least one track extending longitudinally along the circular arc-shape portion of said fixed section, and a wheel assembly mounted on said retractable section and engaging said track so as to guide the retractable section during the raising and lowering thereof in order to prevent binding with the fixed section.

---

4,213,830

## METHOD FOR THE TRANSFER OF HEAT

Franz Köppl, Im Schönblick 41, Tübingen, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,584
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642836
Int. Cl.[2] C02B *1/04*
U.S. Cl. 203—11 14 Claims

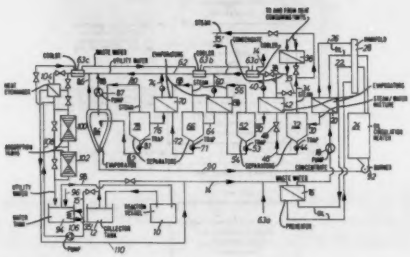
1. A metjhod for the transfer of heat in a system from a heat exchanger containing a fluid heating medium functioning as a heat source to at least one heat consuming unit operated at temperatures above 100° C. and using waste water as a heat transfer medium, said method comprising the steps of:

providing a high pressure section and low pressure section in said system and evaporating a portion of the waste water into steam in said high pressure section of said system by indirect heat exchange with said fluid medium;

separating the steam from the non-evaporated portion of the concentrated liquid waste water and the non-volatile impurities contained therein;

transferring heat by indirect heat exchange from the separated steam to the heat consuming unit;

condensing the steam into condensate suitable for industrial use diverting at least some of the pressurized steam for use in another part of the system when either or both of the following conditions occur: (1) the heat requirements of the heat consuming unit is reduced and (2) the waste water production is increased;



returning the condensate from said heat consuming unit to said low pressure section and transferring the residual heat of said returned condensate by indirect heat exchange to evaporate a further portion of the waste water into steam; and

separating the steam evaporated from said further portion of the waste water from the remaining non-evaporated portion of the waste water.

---

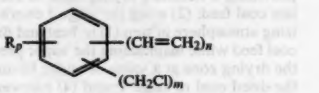
4,213,831

## ALUMINUM CONTAINER FOR PROCESSING VINYLBENZYL CHLORIDES

Richard H. Hall, Midland; Daniel H. Haigh, Beaverton, and Robert D. Hansen, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 30, 1972, Ser. No. 302,231
Int. Cl.[2] B01D *3/00*
U.S. Cl. 203—86 4 Claims

3. A method for processing a compound having the formula



wherein R is an alkyl radical of 1–4 carbon atoms, m and n are independently one or two, and p is zero or one, by distilling, filtering or polymerizing said compound which consists of carrying out said processing in equipment of aluminum or alloy having an aluminum content of at least about 90 percent by weight.

---

4,213,832

## DISTILLATION FOR SEPARATING DIALKYLKETONES FROM LOWER CHLOROHYDROCARBONS

David Zudkevitch, Dover; Nirmal K. Khanna, Scotch Plains, and Robert F. Raczynski, Montague, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

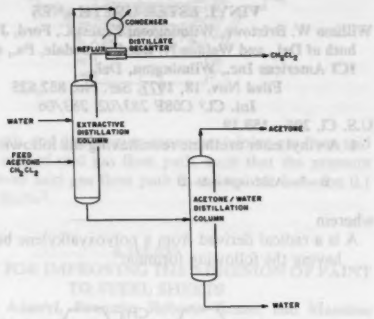
Filed Jun. 21, 1978, Ser. No. 917,608
Int. Cl.[2] B01D *3/38;* C07C *45/24*
U.S. Cl. 203—95 12 Claims

1. The method for separating mixtures of dialkyl ketones

having three to five carbon atoms with halogenated compounds selected from the group consisting of

(a) dihalogenated alkanes having two less carbon atoms than said ketone,

(b) monohalogenated alkanes, straight chain or branched, having the same number of carbon atoms as said ketone and not more than four carbon atoms if the halogen is bromine,




SEPARATION OF ACETONE FROM DICHLOROMETHANE BY EXTRACTIVE DISTILLATION

(c) monohalogenated dialkyl ethers having one carbon atom less than said ketone,

(d) monohalogenated, mono-unsaturated alkenes having the same number of carbon atoms as said ketone, and

(e) mixtures thereof which comprises subjecting said mixture of dialkyl ketones and halogenated compounds to distillation in the presence of water to obtain the halogenated compounds substantially in the overhead condensate and the dialkyl ketones substantially in the bottom streams.

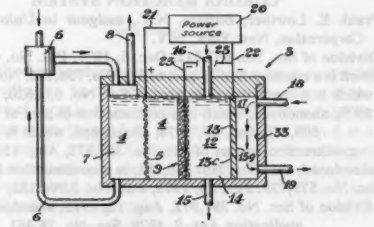
---

**4,213,833**

## ELECTROLYTIC OXIDATION IN A CELL HAVING A SEPARATOR SUPPORT

**Joseph D. Lefevre, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Sep. 5, 1978, Ser. No. 939,602**
**Int. Cl.[2] C25B 1/16, 1/26, 9/04, 13/04**
**U.S. Cl. 204—98** **19 Claims**




1. An improved method of operating an electrolytic cell wherein there is:

an oxidizable material in aqueous dispersion is fed to an anolyte compartment in which there is an electrically charged oxidizing anode producing one product of the electrolysis plus positively charged cations in the anolyte;

a reducible catholyte is maintained in a catholyte compartment in which there is a catalytically active oxygen gas-bearing depolarized reducing cathode that is charged electrically at a lower electric potential than that of the anode producing negatively charged anions in the catholyte for another product of the electrolysis; and

an electrically conductive separator element separating anolyte from catholyte is spaced between the anode and the depolarized cathode and thereby functions to pass cations from the anolyte to the catholyte wherein said cations combine with said anions to produce said catholyte product; while

an appropriate direct current electrical potential is imposed between and across said anode and said cathode so that the anode is electrically more positive than the cathode thereby causing and maintaining the electrolysis of the electrolytic reactions in said anolyte and said catholyte;

wherein the improvement comprises constructing said separator element from materials whereby it is less catalytically active than the cathode and; electrically connecting said separator element and said depolarizing cathode so as to maintain them during electrolysis at about the same electrical potential to render said separator element at least substantially non-bipolarizable.

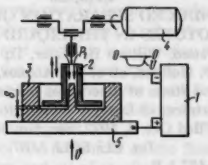
---

**4,213,834**

## ELECTROCHEMICAL WORKING METHOD AND SYSTEM FOR EFFECTING SAME

**Andrei P. Semashko, ulitsa Rossiiskaya, 43/2, kv. 4; Nasikh Z. Gimaev, ulitsa 50 let SSSR, 31, kv. 12; Ivan V. Maximov, ulitsa Stepana Zlobina, 41, kv. 61; Sergei V. Bezrukov, ulitsa Kirova, 41, kv. 37, and Vladimir B. Rabinovich, ulitsa Stepana Zlobina, 42, kv. 46, all of Ufa, U.S.S.R.**

**Filed Feb. 1, 1979, Ser. No. 8,580**
**Int. Cl.[2] B23P 1/14**
**U.S. Cl. 204—129.25** **5 Claims**




1. A method for electrochemical working of metals and alloys with the use of electrodes one of which is a workpiece, whereas the other is a tool electrode, comprising the following sequence of operations:

(a) setting one of said electrodes into forced oscillating motion in relation to the second electrode with the formation of an interelectrode gap;

(b) applying voltage pulses to said electrodes in synchronization with the frequency of said forced oscillation of one of said electrodes;

(c) continuing the application of said voltage pulses to said electrodes even at a moment when said electrodes are at a minimum distance from one the other;

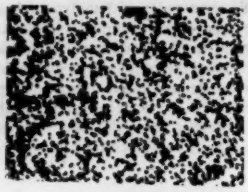
(d) monitoring the change of the relative resistance of said interelectrode gap due to cavitation in the electrolyte as said electrodes are brought apart; said relative resistance meaning the relation between the time-variable resistance of said interelectrode gap and the value of that resistance with a minimum width of said interelectrode gap;

(e) controlling the width of said interelectrode gap and the pressure of the electrolyte at the inlet of the gap by keeping said change of the relative resistance of said interelectrode gap at a desired constant level.

## 4,213,835
## METHOD FOR ELECTROLYTICALLY ETCHING OF A RECRYSTALLIZED ALUMINUM FOIL

**Horst Fickelscher, Heidenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jan. 12, 1979, Ser. No. 2,966**
**Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801218**
**Int. Cl.[2] C25F *3/04***
**U.S. Cl. 204—129.25** **4 Claims**



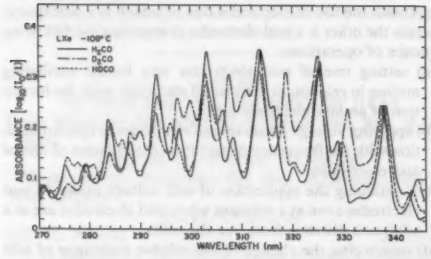
1. A method for electrolytically etching of a recrystallized aluminum foil comprising the steps of providing an etching bath with suitable electrode geometry for etching the foil approximately quasipotentiostatic according to the current density being attained when a constant anode potential is applied, positioning the foil in the bath, and potentiostatically etching the foil with a temporally constant anode potential, the step of etching including applying an anode potential for creating a current density above the current density for creating pitting of the aluminum during a first etching stage and in a following second etching stage reducing the anode potential to create a current density below the density at which pitting occurs.

---

## 4,213,836
## LASER-INDUCED SEPARATION OF HYDROGEN ISOTOPES IN THE LIQUID PHASE

**Samuel M. Freund; William B. Maier, II; Willard H. Beattie, and Redus F. Holland, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Oct. 4, 1977, Ser. No. 839,238**
**Int. Cl.[2] B01J *1/10***
**U.S. Cl. 204—157.1 R** **12 Claims**




1. A process for separating hydrogen isotopes which comprises (a) forming a liquid phase of hydrogen-bearing feedstock compound at a temperature at which the spectral features of the feedstock compound are narrow enough or the absorption edges sharp enough to permit spectral features corresponding to the different hydrogen isotopes to be separated to be distinguished, (b) irradiating the liquid phase at said temperature with monochromatic radiation of a first wavelength which selectively or at least preferentially excites those molecules of said feedstock compound containing a first hydrogen isotope, and (c) subjecting the excited molecules to physical or chemical processes or a combination thereof whereby said first hydrogen isotope contained in said excited molecules is separated from other hydrogen isotopes contained in the unexcited molecules in said liquid phase.

---

## 4,213,837
## VINYL ESTER URETHANES

**William W. Bristowe, Wilmington; Ernest C. Ford, Jr., Newark, both of Del., and Weldon N. Reed, Avondale, Pa., assignors to ICI Americas Inc., Wilmington, Del.**

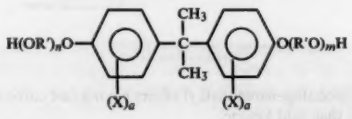
**Filed Nov. 18, 1977, Ser. No. 852,625**
**Int. Cl.[2] C08F *283/02, 283/06***
**U.S. Cl. 204—159.19** **32 Claims**

1. A vinyl ester urethane resin having the following formula:

B—I—A-M—$_y$A—I—B

wherein

A is a radical derived from a polyoxyalkylene bisphenol A having the following formula:




wherein

R′ is $C_1$–$C_4$ alkylene group,

X is halogen

a is an integer equal to from 0 to 2, and

m and n are integers each of which is equal to at least 1 and the sum of which is equal to from about 9 to about 30;

M is a radical derived from (A) an unsaturated aliphatic polycarboxylic acid or an anhydride thereof, (B) a saturated aliphatic polycarboxylic acid or an anhydride thereof; (C) an aromatic polycarboxylic acid or anhydride thereof, or (D) mixtures of A, B, and C;

I is a radical derived from a polyfunctional isocyanate;

B is a radical derived from a monohydroxyl-terminated ester of acrylic acid;

y is an integer equal to from 1 to about 12.

---

## 4,213,838
## CORONA REACTION SYSTEM

**Frank E. Lowther, Buffalo, N.Y., assignor to Union Carbide Corporation, New York, N.Y.**

**Division of Ser. No. 857,512, Dec. 5, 1977, Pat. No. 4,159,425, which is a continuation-in-part of Ser. No. 738,181, Nov. 2, 1976, which is a continuation-in-part of Ser. No. 632,620, Nov. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,278, Sep. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 387,972, Aug. 13, 1973, abandoned, said Ser. No. 738,181, is a continuation-in-part of Ser. No. 579,739, Feb. 20, 1975, Pat. No. 3,996,122, which is a division of Ser. No. 387,972, Aug. 13, 1973, abandoned. This application Apr. 9, 1979, Ser. No. 28,451**
**Int. Cl.[2] C01B *13/11***
**U.S. Cl. 204—176** **9 Claims**

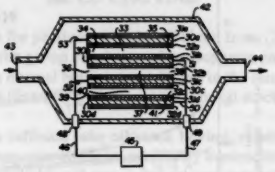
1. A method for generating ozone by corona discharge, comprising the steps of:

(a) providing a corona discharge gas flow path between 2.0 and 10 inches in length, bounded by discharge electrodes spaced apart at distance of between 0.01 and 0.250 inch;

(b) generating substantially uniform corona along the length of said gas flow path at power density of between 3.5 and 33 watts/in$^2$ of electrode surface area; and

(c) flowing an oxygen-containing gas along said corona

discharge gas flow path from the inlet end to the outlet end thereof for said ozone generation, at flow rate sufficient for the gas flow to remove substantially all of the heat generated by said corona discharge from said gas



flow path, and discharging ozone-containing gas from said outlet end of said gas flow path, such that the pressure drop over said gas flow path is maintained between 0.1 and 2 lbs/in$^2$.

---

**4,213,839**

## PROCESS FOR IMPROVING THE ADHESION OF PAINT TO STEEL SHEETS

**Nazzareno Azzerri, Pomezia; Roberto Bruno, and Massimo Memmi, both of Rome, all of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy**

**Filed Apr. 9, 1979, Ser. No. 28,925**
**Claims priority, application Italy, Apr. 14, 1978, 48908 A/78**
**Int. Cl.$^2$ C25D *13/20***
**U.S. Cl. 204—181 R** **5 Claims**

1. A method of producing on a steel sheet a paint system of improved adhesion to the sheet, comprising the steps of immersing a steel sheet in an aqueous solution of sodium sulphate of a concentration from 0.5 M to 2 M at a pH of 6 to 8 at a temperature of 20° to 100° C., connecting the immersed part alternately as cathode and anode for a period of time between 0.1 and 30 seconds at a current density of 1 to 50 A/dm$^2$, and subsequently painting said sheet.

---

**4,213,840**

## LOW-RESISTANCE, FINE-LINE SEMICONDUCTOR DEVICE AND THE METHOD FOR ITS MANUFACTURE

**Masahiro Omori, Palo Alto; James N. Wholey, Saratoga, and J. Ross Anderson, Sunnyvale, all of Calif., assignors to Avantek, Inc., Santa Clara, Calif.**

**Filed Nov. 13, 1978, Ser. No. 959,792**
**Int. Cl.$^2$ H01L *21/441***
**U.S. Cl. 204—192 C** **20 Claims**

1. A method of fabricating a Schottky gate electrode on a field effect transistor between source and drain regions, comprising the steps of

(a) depositing a first layer of photoresist material directly on a planar semiconductor surface,

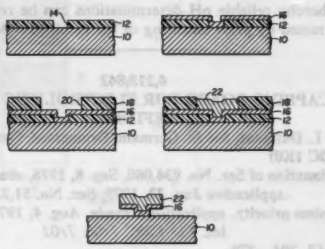
(b) photolithographically defining a first area of the first photoresist layer which area has its shortest dimension in the direction parallel to a hypothetical line extending from the source region to the drain region,

(c) removing the first area to form a base area for the gate electrode,

(d) depositing a first metal layer on top of the remaining first photoresist layer and the base area so that it is in electrical contact with the base area,

(e) depositing a second photoresist layer on the first metal layer,

(f) photolithographically defining an area of the second




photoresist layer to be removed which area overshadows the base area, and removing this defined area to create an enlarged opening in the second photoresist layer, said opening being enlarged in the direction extending parallel to the hypothetical line running from the source region to the drain region, compared to the same dimension of the corresponding opening in the first photoresist layer,

(g) depositing a second metal layer in the enlarged opening of the second photoresist layer to thereby increase the thickness of the gate electrode in a direction perpendicular to the plane of the semiconductor surface while simultaneously enlarging the gate electrode in the direction parallel to the hypothetical line extending from the source region to the drain regions, and

(h) removing all of the remainder of the first and second photoresist layers and all of the first metal layer except that portion underlying the second metal layer.

---

**4,213,841**

## PH MEASURING INSTRUMENT KIT

**Maury Jungman, Bayville, N.Y., assignor to J & M Instruments Corp., Farmingdale, N.Y.**

**Division of Ser. No. 712,666, Aug. 9, 1976, Pat. No. 4,090,925.**
**This application Apr. 4, 1978, Ser. No. 893,478**
**Int. Cl.$^2$ G01N *27/38***
**U.S. Cl. 204—195 R** **5 Claims**

1. A kit for determining the pH value of a specimen, said kit comprising:

(a) a measuring instrument including a pair of electrodes formed of dissimilar metals, an electromotive potential being generated between the electrodes upon placement of the electrodes in the specimen whose pH value is to be determined, meter means, the meter means comprising means quantitatively measuring an electrical characteristic of the specimen as a function of the electrolytic activity of the specimen and display means indicating the pH value of the specimen as a function of the electrical measurement, and

(b) a nonwoven polyamid filamentous web containing an

abrasive material for cleansing the electrodes to remove the contaminants therefrom,

whereby reliable pH determinations can be repeatedly obtained by prior cleansing of the electrodes with the web.

---

**4,213,842**

## CAPPING BOARD FOR ELECTROLYTIC METAL REFINING

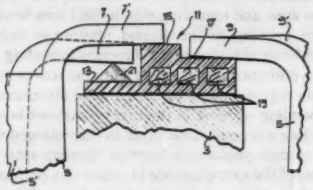
**Jean L. Dufresne, 366 St. Germain, Drummond, Quebec, Canada (J0C 1K0)**

**Continuation of Ser. No. 934,080, Sep. 8, 1978, abandoned. This application Jun. 22, 1979, Ser. No. 51,226**

**Claims priority, application Canada, Aug. 4, 1978, 308835**

**Int. Cl.[2] C25C** *7/00, 7/02*

**U.S. Cl. 204—279** **8 Claims**



1. A capping board for supporting the extremities of electrodes immersed into an electrolytic cell, said capping board being molded from a plastic resin selected from the group consisting of polytetrafluoroethylene and acid resistant polyester, vinylester, epoxy and phenolic resins containing from 10 to 20% by weight of fiberglass, from 2 to 10% by weight of silica, from 2 to 10% by weight of mica and from 2 to 10% by weight of feldspar.

---

**4,213,843**

## ELECTROLYSIS ELECTRODES AND METHOD OF MAKING SAME

**Hideo Sato, and Takayuki Shimamune, both of Ichihara, Japan, assignors to Permelec Electrode Ltd., Ichihara, Japan**

**Filed Mar. 9, 1979, Ser. No. 19,208**

**Claims priority, application Japan, Mar. 24, 1978, 53/3300878**

**Int. Cl.[2] C25B** *11/08, 11/10*

**U.S. Cl. 204—290 F** **9 Claims**

1. An electrode for use in electrolysis of an aqueous solution of a metal halide comprising:

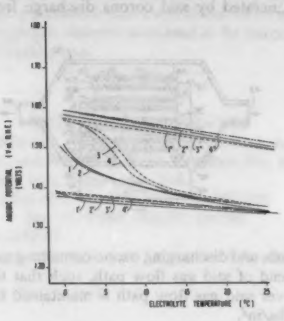
(a) an electroconductive substrate; and

(b) a coating on said substrate, said coating consisting essentially of:

(i) 5 to 75 mole percent of iridium oxide;

(ii) 5 to 70 mole percent of at least one metal oxide selected from the group consisting of oxides of titanium, tantalum and niobium, and

(iii) 20 to 70 mole percent of at least one of a member selected from the group consisting of tin oxide and cobalt oxide, with the sum of the mole percent of the



iridium oxide (i) plus the mole percent of the metal oxide (ii) being at least 30 mole percent.

---

**4,213,844**

## ION PLATING APPARATUS

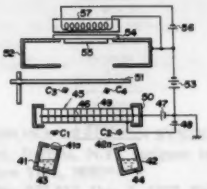
**Kiyoshi Morimoto; Hiroshi Watanabe, both of Mobara, and Toshinori Takagi, Nagaokakyo, all of Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan**

**Filed Dec. 12, 1978, Ser. No. 968,817**

**Claims priority, application Japan, Dec. 13, 1977, 52-148869**

**Int. Cl.[2] C23C** *15/00*

**U.S. Cl. 204—298** **5 Claims**



1. In an ion plating apparatus having a plurality of vapor sources for supplying the vapors of evaporating materials, and the particles of said vapors being ionized and accelerated by an electric field to impinge on the surface of a substrate so as to form a film of said evaporating materials thereon, the improvement which comprises an ionization chamber provided so that it is common to a plurality of said vapor sources and positioned between said sources and said substrate, said ionization chamber comprising a plurality of parallel filaments extending along opposite sides of said chamber adapted to emit electrons when energized and heated and a plurality of electron-accelerating electrodes, all said electrodes provided between said filaments so that the vapors of the evaporating materials generated from said vapor sources pass between said electron accelerating electrodes, and said electron-accelerating electrodes adapted to be kept at a positive potenital with respect to said filaments thereby to ionize the vapors of the evaporating materials supplied from said plurality of said vapor sources.

4,213,845

## LUBE OIL BLEND PROCESS AND COMPOSITION

Gary M. Masada, Corte Madera, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 13, 1978, Ser. No. 969,131
Int. Cl.[2] C10G 41/00
U.S. Cl. 208—19 8 Claims

1. A process for producing a lube oil blend from (1) a gas oil selected from the group consisting of atmospheric and vacuum gas oils having normal boiling point ranges in the range 260° C. to 565° C., and (2) a raw hydrocrackate lube oil stock comprising:

producing a raffinate lube oil stock having, relative to said gas oil, a superior sunlight stability by contracting said gas oil with a suitable solvent under solvent-extracting conditions; and

producing said blend by admixing said raffinate and raw stock, said blend (1) containing, in parts by volume, for each 100 parts of raffinate an amount of the raw stock in the range of from about 10 to 45 parts, and (2) exhibiting sunlight stability which is at least equivalent to that of said raffinate stock.

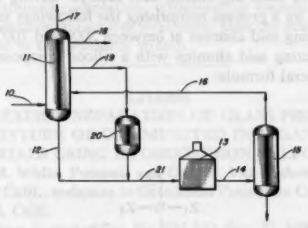
---

4,213,846

## DELAYED COKING PROCESS WITH HYDROTREATED RECYCLE

Matthew C. Sooter; Lloyd G. Becraft, and William H. Kegler, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Jul. 17, 1978, Ser. No. 925,250
Int. Cl.[2] C10G 9/14
U.S. Cl. 208—50 7 Claims



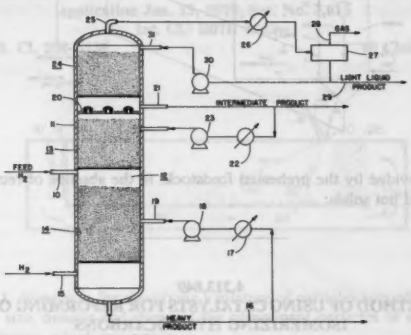
1. In a delayed coking process in which a liquid hydrocarbonaceous premium coke feedstock selected from the group consisting of thermal tar, pyrolysis tar, decant oil from a catalytic cracking operation and mixtures thereof combined with petroleum resid in an amount of up to 50 weight percent is heated in a coker furnace and then fed to a delayed coking drum, and in which overhead vapors from said coking drum are passed to a coker fractionator where they are separated into light hydrocarbon products and recycle gas oil, and in which said recycle gas oil is combined with said feedstock and returned directly to said coking furnace, the improvement wherein said recycle gas oil is hydrotreated after being separated from said light hydrocarbon products and prior to being combined with said feedstock and returned directly to said coking furnace and wherein the coke product from said delayed coking drum has a CTE of less than $5.0\times10^{-7}$/° C.

4,213,847

## CATALYTIC DEWAXING OF LUBES IN REACTOR FRACTIONATOR

Nai Y. Chen, Titusville, N.J., and Ikai Wang, Hsinchu, Taiwan, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 922,915, Jul. 10, 1978. This application May 16, 1979, Ser. No. 39,468
Int. Cl.[2] C10G 13/10, 13/16, 41/00
U.S. Cl. 208—111 9 Claims




1. A process for catalytic, shape selective hydrodewaxing of lubricating oil fractions with improved viscosity index of the lubricating oil product which comprises introducing such fraction to an intermediate point in a vertical column of a hydrodewaxing catalyst maintained at hydrodewaxing conditions, introducing hydrogen to said column below said intermediate point for flow upwardly in said column, maintaining a temperature gradient in said column from a maximum below said intermediate point to a minimum thereabove whereby higher boiling constituents of said fraction are caused to flow downwardly as liquid countercurrent to said hydrogen at conversion conditions while lighter constituents of said fraction and conversion products are caused to flow upwardly as vapor concurrent with said hydrogen resulting in dewaxing conversion of different constituents at different levels of severity, withdrawing liquid lubricating oil products from the bottom of said column and withdrawing from the top of said column distillate lubricating products having improved viscosity index by reason of lower severity of treatment as compared with the same fraction when so treated at the same severity as that applied to said higher boiling constituents.

---

4,213,848

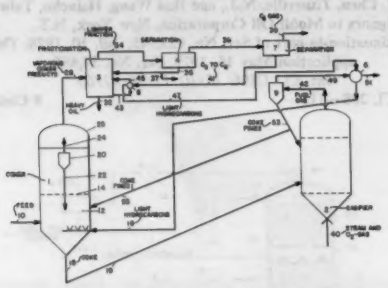
## FLUID COKING AND GASIFICATION PROCESS

Arthur L. Saxton, Warren, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 806,350, Jun. 14, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,728
Int. Cl.[2] C10G 9/32
U.S. Cl. 208—127 20 Claims

1. In a fluid coking process comprising the step of reacting a preheated carbonaceous material feedstock in a coking zone containing a bed of fluidized solids maintained in a fluidized state by the introduction of a fluidizing gas, at fluid coking conditions, to form a coking zone vapor phase conversion product and coke, the improvement which comprises introducing into said coking zone hot light hydrocarbons in an

amount and at a temperature sufficient to provide substantially all of the heat requirement of said coking zone above that



provided by the preheated feedstock, in the absence of recycled hot solids.

---

**4,213,849**

## METHOD OF USING CATALYSTS FOR REFORMING OR ISOMERIZING HYDROCARBONS

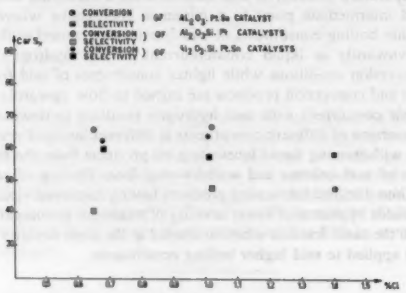
**Philippe Engelhard, Le Havre; Michel Legendre, Montivillier; Guy Paris, Le Havre, and Georges Szabo, Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France**

**Division of Ser. No. 784,516, Apr. 4, 1977, Pat. No. 4,159,257. This application Apr. 9, 1979, Ser. No. 28,444**

**Claims priority, application France, Apr. 5, 1976, 76 09831**

**Int. Cl.[2] C10G 35/08**

**U.S. Cl. 208—139** **40 Claims**




**1.** Method for the reforming of hydrocarbon fractions whose sulfur content is under 10 ppm, and whose boiling temperature under atmospheric pressure is between 35° and 250° C., comprising the use of a catalyst, in the presence of hydrogen, wherein said carrier is formed essentially of alumina, having between 0.1 and 3% of halogen present in a form combined with at least one other catalyst component, and further comprising on said carrier:

(a) from 0.02 to 2% of at least one platinum-group metal ingredient,

(b) from 0.02 to 2% of a tin ingredient,

(c) from 0.01 to 5% of a silicon ingredient, said percentages being based on the total catalyst weight per elemental form of each ingredient, said catalyst having been prepared by a process comprising the following steps:

calcining said alumina at between 300° and 700° C.,

contacting said alumina with a silicon compound of the general formula:

where $Z_1$, $Z_2$, $Z_3$, and $Z_4$ are each a halogen atom or a hydrocarbon radical having from one to four carbon atoms, said contacting step being followed by calcination at between 300° and 700° C.;

at least one impregnation of the alumina with at least one solution containing a compound of at least one element from the group consisting of the platinum-group metals and tin; said alumina being calcined after deposition of the platinum-group metals, at a temperature of less than 600° C. and, in the case of platinum at less than 550° C., and/or subjected to a water wash, and, after deposition of the tin when tin is deposited first, calcined at between 400° and 700° C. and/or subjected to a water wash; and

after the deposition of all metals, at least one calcination at a temperature of less than 550° C.,

incorporating said halogen on said carrier during preparation of the carrier or deposition of said ingredients or both.

**21.** Method for the isomerization hydrocarbons in the presence of hydrogen, comprising the use of a catalyst wherein said carrier is formed essentially of alumina, having between 0.1 and 3% of halogen present in a form combined with at least one other catalyst component, and further comprising on said carrier:

(a) from 0.02 to 2% of at least one platinum-group metal ingredient,

(b) from 0.02 to 2% of a tin ingredient,

(c) from 0.01 to 5% of a silicon ingredient, said percentages being based on the total catalyst weight per elemental form of each ingredient, said catalyst having been prepared by a process comprising the followings steps:

calcining said alumina at between 300° and 700° C.,

contacting said alumina with a silicon compound of the general formula:

where $Z_1$, $Z_2$, $Z_3$, and $Z_4$ are each a halogen atom or a hydrocarbon radical having from one to four carbon atoms, said contacting step being followed by calcination at between 300° and 700° C.;

at least one impregnation of the alumina with at least one solution containing a compound of at least one element from the group consisting of the platinum-group metals and tin; said alumina being calcined after deposition of the platinum-group metals, at a temperature of less than 600° C. and, in the case of platinum at less than 550° C., and/or subjected to a water wash, and, after deposition of the tin when tin is deposited first, calcined at between 400° and 700° C. and/or subjected to a water wash; and

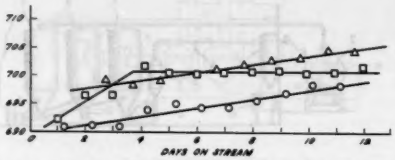
after the deposition of all metals, at least one calcination at a temperature of less than 500° C.,

incorporating said halogen on said carrier during preparation of the carrier or deposition of said ingredients or both.

## 4,213,850
## HYDRODESULFURIZATION OF OIL FEEDSTOCK WITH PRESULFIDED CATALYST

**Frank C. Riddick, Jr., Orange, and Bernal Peralta, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 800,792, May 26, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,450**
**Int. Cl.² C10G *23/02***
**U.S. Cl. 208—216 R** **6 Claims**




1. A process for the desulfurization of a mineral oil feedstock containing organic sulfur compounds, which comprises contacting said feedstock plus added hydrogen, and under hydrofining conditions with a sulfided bed of catalyst comprising cobalt and/or nickel plus molybdenum and/or tungsten supported on a porous carrier which is essentially alumina, said catalyst bed having been converted from its initial oxide form to said sulfided form by a method which comprises passing a fluid sulfiding stream through said catalyst bed, said sulfiding stream comprising at the inlet to said catalyst bed (1) a gas stream comprising hydrogen, (2) sufficient free $H_2S$ to provide an $H_2S$ concentration in said gas stream of between about 0.3 and 10.0 vol % and (3) a liquid mineral oil fraction having a 50% boiling point above about 600° F. and containing at least about 0.5 wt.% of native organic sulfur, maintaining contacting temperatures in said bed above about 450° F. but not high enough to convert more than about 90% of said organic sulfur to $H_2S$ whereby some $H_2S$ is continuously generated throughout said bed, and while resultant sulfiding of said catalyst bed proceeds toward completion, withdrawing therefrom a total fluid effluent containing less total sulfur than the amount being fed thereto in said sulfiding stream.

## 4,213,851
## FLOTATION SEPARATION OF GLASS FROM A MIXTURE OF COMMINUTED INORGANIC MATERIALS USING HYDROCARBON SULFONATES

**William R. White, Pomona, and Gary P. Van Tighem, Ontario, both of Calif., assignors to Occidental Petroleum Corporation, Upland, Calif.**

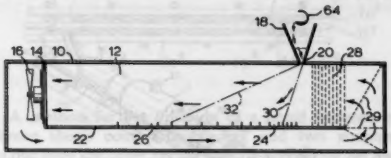
**Continuation-in-part of Ser. No. 835,792, Sep. 22, 1977, Pat. No. 4,122,950, which is a continuation of Ser. No. 634,640, Nov. 24, 1975, abandoned. This application Aug. 11, 1978, Ser. No. 932,967**
**The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.**
**Int. Cl.² B03B *7/00***
**U.S. Cl. 209—12** **25 Claims**

1. A process for the recovery of glass from solid wastes which comprises activating the surface of glass particles contained in a particulate mixture of glass containing inorganic materials formed from municipal solid waste and having a particle size up to about 10 mesh with at least one metal ion in a divalent or trivalent state and selected from metals of Groups II(a), III(b), IV(b), VII(a) and VIII of the Periodic Table at a pH where the metal ion chemically associates with the glass particles and at a pH where the metal ion remains chemically associated with the glass particles, to the action of a beneficiating amount of a collector reagent which is at least one water compatible sulfonated hydrocarbon containing at least 5 carbon atoms to form a float fraction comprising predominantly glass particles and an inorganic tailing of reduced glass content and including inorganic materials, exclusive of particulate glass particles, which are non-responsive to the beneficiating action of the collector reagent.

## 4,213,852
## METHOD AND APPARATUS FOR PARTICLE CLASSIFICATION

**Bernard Etkin, 44 Charles St. W., Toronto, Ontario, Canada (M4Y 1R8)**

**Continuation of Ser. No. 840,490, Oct. 7, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,615**
**Int. Cl.² B07B *4/02***
**U.S. Cl. 209—136** **10 Claims**




1. Apparatus for classifying a mixture of particles according to size, density and shape of the component particles of said mixture, which comprises:

a gas flow tunnel having an upstream end and a downstream end;

a return conduit connecting the downstream end of the gas flow tunnel to the upstream end thereof, said return conduit and said gas flow tunnel being arranged adjacent to and generally alongside one another and communicating with one another at the upstream end of the gas flow tunnel to form a gas circulation duct;

a gas recirculation means in said return conduit to circulate gas through the gas flow tunnel and through the return conduit, the gas flow directions in the gas flow tunnel and in the return conduit being substantially opposed to one another;

a plurality of low turbulence gas flow-producing screens located in the path of air flow adjacent the upstream end of said gas flow tunnel and in the return conduit where it communicates with the gas flow tunnel and where the circulating gas therein changes its flow direction on passing from the return conduit to the gas flow tunnel, the upstream ones of said screens in the return conduit being angularly disposed with respect to one another, said screens being adapted to produce substantially uniform gas flow in the downstream direction and at a substantial angle to the vertical of RMS turbulence not greater than about 1%, with said tunnel;

feeding means near the upstream end of said tunnel, and communicating with the upper portion of said tunnel, and adapted to feed particles into the upper portion of said gas flow tunnel;

a plurality of particle collection means disposed along the bottom of the gas flow tunnel, serially arranged adjacent one another at increasing distances downstream from said feeding means.

## 4,213,853
## FROTH FLOTATION

**M. Phillip Jameson, Somerville, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, N.J.**

**Filed Jan. 25, 1978, Ser. No. 872,332**
**Int. Cl.² B03D *1/02***
**U.S. Cl. 209—166** **11 Claims**

4. A process for concentrating cassiterite from a slimed ore pulp without desliming said pulp which comprises treating said pulp with an alum sodium silicate hydrosol, adjusting pH to a

value in the range of 4 to 7, conditioning said pulp, using high energy agitation, with a dilute aqueous emulsion containing mineral oil and an N-alkyl sulfosuccinamate in which the alkyl group contains 12 to 22 carbon atoms and subjecting the pulp, without removing slimes, to froth flotation at a pH in the range of 4 to 7.

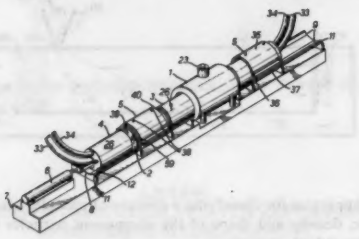
---

**4,213,854**

## MAGNETIC SEPARATING APPARATUS WITH MAGNETIC SHIELDING MEANS

**Zdenek J. J. Stekly, Hampshire Ct., Wayland, Mass. 01778**

**Filed Feb. 27, 1978, Ser. No. 881,810**
**Int. Cl.[2] B03C *1/10***
**U.S. Cl. 209—223 R** **8 Claims**



1. Magnetic separating apparatus comprising:

means for establishing a magnetic field in a predetermined zone;

a separating chamber having an inlet and an outlet for a fluid which carries magnetizable particles sought to be separated by said apparatus;

fluid-permeable and magnetizable packing material disposed within the separating chamber for collecting said particles when said chamber is in said predetermined zone;

means for moving the separating chamber between said predetermined zone and a cleaning and flushing zone remote from said predetermined zone whereat magnetizable particles collected at said packing material are flushed from said material to clean some for reuse; and

ferromagnetic shielding means for magnetically screening said separating chamber at said cleaning and flushing zone to facilitate said cleaning and flushing; said means comprising a continuous ferromagnetic cylinder for receiving said chamber therein, and a pair of ferromagnetic discs cooperating with and substantially closing the ends of said cylinder, to thereby substantially enclose all sides of said separating chamber when within said cleaning and flushing zone.

---

**4,213,855**

## SIFTING EQUIPMENT FOR FINE-GRAINED BULK MATERIAL, PARTICULARLY FLOUR

**Andreas Von Bennigsen-Mackiewicz, and Christoph Von Bennigsen-Mackiewicz, both of 3211 Bantein, Fed. Rep. of Germany**

**Continuation of Ser. No. 541,986, Jan. 17, 1975, abandoned. This application Aug. 22, 1977, Ser. No. 826,866**
**Claims priority, application Fed. Rep. of Germany, Jan. 23, 1974, 2403091; Dec. 17, 1974, 2459537**
**Int. Cl.[2] B07B *1/06, 7/06***
**U.S. Cl. 209—240** **23 Claims**

1. Sifting apparatus for fine grained bulk material comprising:

(a) a storage receptacle for said bulk material;

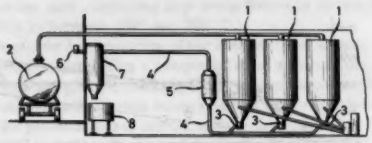
(b) receiving means for use of said bulk material;

(c) a transmission line connecting said storage receptacle and said receiving means;

(d) transit chamber means with a lengthwise axis mounted vertically as regards its lengthwise axis in said transmission line, said transit chamber means having a transmission line inlet connected to said transmission line between said storage receptacle and said transit chamber means, a transmission line outlet connected to said transmission line between said transit chamber means and said receiving means and a sifted material outlet at the bottom of said transit chamber means;

(e) a suction blower mounted in said transmission line between said transit chamber means and said receiving means;

(f) sieve means mounted in said transit chamber means approximately orthogonal to said lengthwise axis of the transit chamber means;



(g) a shut off valve mounted in said transmission line outlet that interrupts the transmission process in impulse-like manner, thereby generating back pressure for detaching contaminant particles adhering to said sieve means, said transmission line inlet positioned between a first hinged damper and said shut off valve;

(h) said first hinged damper positioned in said sifted material outlet and opening simultaneously with the interruption of said transmission process.

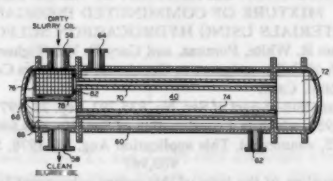
---

**4,213,856**

## METHOD AND APPARATUS FOR CLASSIFYING SOLIDS AND TRANSPORTING SOLIDS-LADEN FLUID

**Larry V. Blake, Bartlesville, Okla.; Donald E. Womeldorph, Jr., Sweeny, Tex.; Oliver M. Surber, Sweeny, Tex., and John P. James, Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Dec. 1, 1978, Ser. No. 965,718**
**Int. Cl.[2] B07B *1/00, 7/06***
**U.S. Cl. 209—250** **7 Claims**



1. Apparatus for classifying solids and transporting a solids-laden fluid comprising:

at least one elongated tubular fluid transport means of circular cross section having an inlet end and a discharge end and adapted to transport a solids-laden fluid therethrough; and

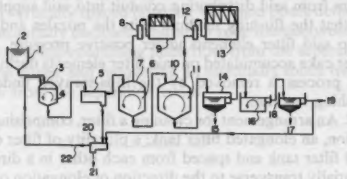
at least one screening means mounted adjacent said inlet end of said transport means, having a plurality of square openings whose diagonal dimension is substantially equal to the internal diameter of said fluid transport means and adapted to screen out and prevent the passage into said fluid transport means of solids having a maximum dimension capable of plugging said fluid transport means and to pass therethrough said fluid containing solids having a maximum dimension incapable of plugging said fluid transport means.

4,213,857

## ANAEROBIC DIGESTION PROCESS

Masahiko Ishida; Ryoichi Haga, and Yoji Odawara, all of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 14, 1978, Ser. No. 942,285
Claims priority, application Japan, Sep. 14, 1977, 52-109973
Int. Cl.² C02C 1/16
U.S. Cl. 210—6 21 Claims



1. An anaerobic digestion process comprising the following steps:

(1) Heating and stirring a mixture of crushed organic waste and the waste water obtained in step (9) at a temperature of 55°–75° C., while maintaining the pH of said mixture at 2.5–4.0 for making a slurry from said mixture,

(2) Obtaining a separated liquid portion and a residue from the slurry recovered from the first step by solid/liquid separation,

(3) Anaerobically digesting the separated liquid portion recovered from the second step under neutral to slightly alkaline conditions by introducing liquefaction and gasification bacteria to said liquid portion,

(4) Obtaining separated water by removing digestive sludge from the slurry obtained from the third step by solid/liquid separation,

(5) Aerobically treating the separated water obtained from step (4),

(6) Obtaining an effluent by solid/liquid separation from the liquid aerobically treated in step (5),

(7) Mixing together a part of the separated water obtained from step (6) with the residue obtained from the step (2),

(8) Obtaining washed residue and waste wash water from the mixture at the seventh step by solid/liquid separation, and

(9) Supplying said waste wash water obtained in step (8) to step (1).

13. An anaerobic digestion process comprising the following steps:

(1) Heating and stirring a mixture of crushed organic waste and the waste wash water obtained in step (9) at a temperature of 55°–75° C., while maintaining the pH of said mixture at 8.0–9.8 for making a slurry from said mixture,

(2) Obtaining a separated liquid portion and a residue from the slurry recovered from the first step by solid/liquid separation,

(3) Anaerobically digesting the separation liquid portion recovered from the second step under neutral to slightly alkaline conditions by introducing liquefaction and gasification bacteria to said liquid protion,

(4) Obtaining separated water by removing digestive sludge from the slurry obtained from the third step by solid/liquid separation,

(5) Aerobically treating the separated water obtained from step (4),

(6) Obtaining an effluent by solid/liquid separation from the liquid aerobically treated in step (5),

(7) Mixing together a part of the separated water obtained from step (6) with the residue obtained from the step (2),

(8) Obtaining washed residue and waste wash water from the mixture at the seventh step by solid/liquid separation, and

(9) Supplying said waste wash water obtained in step (8) to step (1).

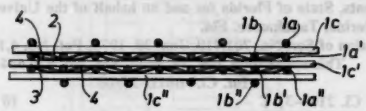
---

4,213,858

## SUPPORTING NET

Nils G. E. Boberg, Lund, and Per-Olov A. V. Carlsson, Sosdala, both of Sweden, assignors to Gambro AB, Sweden

Filed Nov. 17, 1978, Ser. No. 961,481
Claims priority, application Sweden, Nov. 18, 1977, 7713019
Int. Cl.² B01D 13/00, 31/00
U.S. Cl. 210—23 R 26 Claims



14. A method for the diffusion of a liquid between two membrane sheets comprising placing said two membrane sheets one over the other between a first supporting net and a second supporting net, said first and second supporting nets each comprising

(a) an outer layer of first strands, said first strands being spaced apart and substantially parallel to each other,

(b) an intermediate supporting layer of second strands, and

(c) an inner layer of third strands, said third strands being spaced apart and substantially parallel to each other, said third strands being substantially parallel to said first strands and being in a spaced relationship to said first strands such that, upon clamping of said membrane sheets between said first and second supporting nets, the first strands in the outer layer of said second supporting net penetrate into the spaces between the third strands of said inner layer of said first supporting net so as to clamp said membrane sheets against said intermediate supporting layers of said first supporting net and said second supporting net; and diffusing said liquid between said membrane sheets.

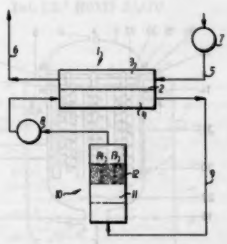
---

4,213,859

## DIALYSIS WITH ION EXCHANGE EXTRACTION OF PHOSPHATES

Robert Smakman, Nigtevecht, and Gerrit H. van den Berg, Amsterdam,, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 10, 1978, Ser. No. 895,057
Claims priority, application Netherlands, Apr. 12, 1977, 7703937
Int. Cl.² B01D 13/00, 15/04, 31/00
U.S. Cl. 210—27 19 Claims



1. An apparatus for the purification of blood comprising at least one selectively permeable membrane, a blood compartment on one side of the membrane and a clearance compartment on the other side thereof, means for passing through said

compartments blood and a dialysis liquid, respectively, for removing the waste products from the blood, and a sorbent which is in contact with the clearance liquid and serves to extract phosphates from the liquid discharged from the clearance compartment, said sorbent being an organic cation exchanger charged with ions of a metal whose phosphate is poorly soluble in water.

---

**4,213,860**

## AFFINITY CHROMATOGRAPHY AND SUBSTRATE USEFUL THEREFOR

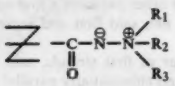
**John C. M. Tsibris, Gainesville, Fla., assignor to Board of Regents, State of Florida for and on behalf of the University of Florida, Tallahassee, Fla.**

**Division of Ser. No. 701,410, Jun. 30, 1976, Pat. No. 4,162,355. This application Jun. 29, 1978, Ser. No. 920,634**

**Int. Cl.[2] B01D** *15/08*

**U.S. Cl. 210—31 C** **10 Claims**

1. A system suitable for affinity chromatography comprising a column of support material coated with an addition copolymer of (1) at least one aminimide of the structural formula:



wherein

$R_1$ and $R_2$ are the same or different and represent lower alkyl;

$R_3$ represents an organic group, and

Z represents the residue of a polymerizable vinyl compound, and (2) a vinyl compound having at least one pendant halomethyl group; said copolymer having coupled thereto an amine ligand which affords sites for binding an affinity chromatography by reaction of said amine with a portion of the pendant halomethyl groups, the remainder of said pendant halomethyl groups being reacted with an amine containing a pendant hydrophilic group.

---

**4,213,861**

## PRESSURE FILTER AND PROCESS FOR CLEANING IT

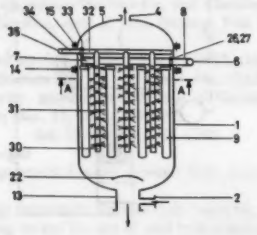
**Hans Müller, Erlenbach, and Konstantin Sotirianos, Stäfa, both of Switzerland, assignors to Chemap AG, Männedorf, Switzerland**

**Division of Ser. No. 832,979, Sep. 13, 1977, Pat. No. 4,163,724. This application May 10, 1978, Ser. No. 904,560**

**Claims priority, application Switzerland, Sep. 16, 1976, 11854/76; Nov. 23, 1976, 14743/76; Dec. 18, 1976, 16050/76; Dec. 24, 1976, 16362/76; Jan. 12, 1977, 445/77; Feb. 9, 1977, 1759/77**

**Int. Cl.[2] B01D** *29/38*

**U.S. Cl. 210—82** **3 Claims**




1. A process of cleaning a filter comprised of elongated filter tank and a plurality of filter elements in the filter tank and spaced from each other in a direction substantially transverse to the elongation of the filter tank, comprising the steps of arranging said filter elements in a plurality of rows located one after the other and parallel to each other; positioning a plurality of further rows of flush-medium supplying tubes, also located one after the other and parallel to said first-mentioned rows of said filter elements, so that each of said supplying tubes are located between two adjacent filter elements, each of said tubes having a plurality of uniformly distributed openings provided with nozzles each of which is open toward the adjacent filter elements; communicating said supplying tubes with a common distributing conduit; and supplying a flushing medium from said distributing conduit into said supplying tubes, so that the flushing medium exits the nozzles and is sprayed onto said filter elements under positive pressure, whereby a filter cake accumulated on said filter elements during the filtering process is removed by the thus-sprayed under pressure flushing medium.

2. An arrangement for cleaning a filter, comprising in combination, an elongated filter tank; a plurality of filter elements in said filter tank and spaced from each other in a direction substantially transverse to the direction of elongation of said tank, said filter elements being arranged in a plurality of rows each located one after the other and parallel to each other; a plurality of further rows of flush-medium supplying tubes, located one after the other and parallel to said first-mentioned rows of said filter elements, so that each supplying tube is located between two adjacent filter elements, each of said supplying tubes having a plurality of uniformly distributed openings provided with nozzles each of which is open toward the adjacent filter elements; a common distributing conduit communicating a source of the flushing medium with said tubes; and means for imparting pressure to the flushing medium, so that the latter is supplied from said distributing conduit into said supplying tubes, exits said nozzles, and is sprayed under positive pressure onto said filter elements to thereby remove a filter cake accumulated on said filter elements during the filtering process.

---

**4,213,862**

## GRAVITY SETTLING

**H. R. Davis, Glenridge; R. H. Long, Morristown, and A. A. Simone, Dover, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.**

**Division of Ser. No. 835,498, Sep. 22, 1977, Pat. No. 4,133,758, which is a continuation-in-part of Ser. No. 720,686, Sep. 7, 1976, abandoned. This application May 1, 1978, Ser. No. 901,295**

**Int. Cl.[2] B01D** *21/10*

**U.S. Cl. 210—83** **6 Claims**

1. A gravity settler for effecting solid-liquid separation, comprising:

a vessel, at least two vertically spaced essentially planar inverted V-shaped plates within the vessel, each of said inverted V-shaped plates being comprised of first and second downwardly oppositely inclined essentially planar sections which extend from the apex of the inverted V-shaped plate within the vessel to the lower portion thereof, adjacent the vessel wall, said at least two vertically spaced inverted V-shaped plates defining a substantially enclosed liquid-solid separating chamber therebetween;

inlet means for introducing liquid-solid feed into said chamber;

first and second underflow outlet means positioned above and adjacent to the lower portions of said first and second sections of the lower of the at least two inverted V-shaped plates; and

overflow outlet means below and adjacent to the apex of the higher of the at least two inverted V-shaped plates for withdrawing clarified liquid from said chamber.

5. A process for separating solids from a coal liquefaction product by gravity settling, comprising:

introducing a coal liquefaction product containing dispersed solids into a gravity settler at multiple locations; intercepting the settling path of the solids below each of the feed

locations by bringing the solids into contact with essentially planar inclined intercepting surfaces which divide the gravity settler into separate separation zones within the settler to the lower portion thereof, thereby coalesce the solids and increase the solids settling rate, said inclined, intersecting surfaces being at least two vertically spaced, inverted V-shaped plates each being comprised of first and second downwardly oppositely inclined essentially planar sections which extend from the apex of the inverted V-shaped plate to adjacent the settler wall, said at least two vertically spaced inverted V-shaped plates defining a substantially enclosed separation zone therebetween; recovering solids containing underflow from the separate separation zones; and recovering an essentially solids free overflow from the separation zones.

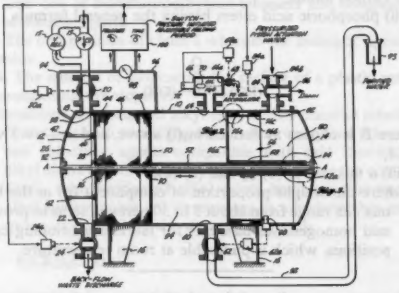
---

**4,213,863**

## FLOW-THROUGH COALESCING SEPARATOR

**Joseph W. Anderson, Bellevue, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.**

**Filed Jan. 8, 1979, Ser. No. 1,743**
**Int. Cl.[2] B01D *29/02***
**U.S. Cl. 210—108** **16 Claims**



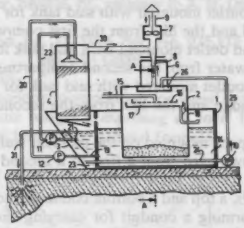
1. Apparatus for separating from water coalesced oil and uncoalesced oil, with solids and without solids, comprising a pressure vessel having a substantially cylindrical inside wall including therein a liquid receiving chamber and a processed liquid collecting chamber axially separated from said receiving chamber by an axially stretchable and compressible cylindrical filter body of open-pore flexible filter material received in sliding contact with said inside wall, said filter body substantially tightly filling the cross-sectional area of said vessel and having transversely disposed opposite end faces, multi-apertured end members attached to the respective end faces of said filter body so as to exert tension in the filter body over substantially the full cross-sectional area thereof by relative separation movement of said end members, the first such end member adjacent said receiving chamber being fixed against axial movement in said pressure vessel, the second such end member being axially movable in said vessel, means to introduce liquids under pressure into the receiving chamber, means to conduct liquids from the receiving chamber, means to conduct liquids from the collecting chamber after passing through the filter body, and force-applying means connected to said second end member and selectively operable to apply force thereto for moving the same axially in either of opposite directions, thereby alternately to stretch out the filter body forcibly to predetermined length and to compress the filter body against said first end member so as to squeeze oil and solids therefrom in a backwash direction.

**4,213,864**

## COMBINATION OF A BIOLOGICAL DRY TOILET AND A BIOLOGICAL WASTE WATER PURIFYING PLANT

**Aimo Asikainen, Lahti, Finland, assignor to Asko-Upo Oy, Lahti, Finland and AGA Heating AB, Gotenberg, Sweden**

**Filed Jan. 9, 1979, Ser. No. 2,058**
**Claims priority, application Finland, Jan. 24, 1978, 780219**
**Int. Cl.[2] C02C *1/04***
**U.S. Cl. 210—151** **2 Claims**



1. An integrated domestic sewage disposal and water purification system comprising in combination:

a dry toilet tank;

an equalizing basin forming a water jacket around said dry toilet tank;

a biofilter through which the water to be purified is circulated;

a sludge sedimentation tank located below said biofilter and having an upper part and a lower part;

first pipe means including a first pump for removing water from the upper part of the sedimentation tank to the biofilter;

second pipe means including a second pump for removing sludge from the lower part of the sedimentation tank to a point in the upper part of the dry toilet tank;

third pipe means for feeding gray water from the household to filter means inside the dry toilet and then to a collecting basin;

fourth pipe means connecting said collecting basin to the equalizing basin;

fifth pipe means including a third pump for feeding water from the equalizing basin to the biofilter; and overflow pipe means for discharging excess water from the upper part of the sedimentation tank to ground.

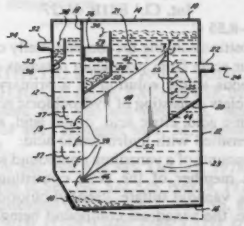
---

**4,213,865**

## APPARATUS FOR SEPARATING SLUDGE, OIL AND THE LIKE FROM CONTAMINATED WATER

**Karl Wagner, Houston, Tex., assignor to Fabrication Unlimited, Inc., Houston, Tex.**

**Filed Jul. 21, 1978, Ser. No. 927,141**
**Int. Cl.[2] B01D *21/10***
**U.S. Cl. 210—522** **4 Claims**



1. Apparatus for separating sludge, oil and the like from contaminated water, comprising:

(a) a process tank having walls separating the tank into first and second compartments, one of said walls being substantially vertical and having an opening at the lower portion thereof to permit passage of the contaminated water from the first to the second compartment, and another of said walls being mounted in said tank intermediate the upper and lower portions of said tank, being positioned at an incline and being connected to the lower extremity of the first of said separating walls;

(b) an inlet mounted with said tank for carrying the contaminated water into the first compartment;

(c) a first outlet mounted with said tank for removing separated oil and the like from the first compartment;

(d) a second outlet mounted with said tank for removing the treated water from the second compartment;

(e) a third outlet mounted with said tank for removing separated sludge and the like from the second compartment; and

(f) a plate pack mounted on the inclined wall in said tank to slope downward from a first to a second end, said pack having

side walls, a top and a bottom connected to said side walls and forming a conduit for carrying the contaminated water from the first to the second end, said second end being mounted near the opening through said one wall in said tank, and a plurality of corrugated plates mounted one above the other and extending between said side walls to provide a plurality of passageways, said plates being sufficiently displaced from one another to permit laminar flow of the water through the passageways and the corrugations of said plates defining a plurality of upper and lower channels generally parallel with said other of said walls, the water passing from the first to the second compartment by flowing downwardly through the passageways and lower channels, the oil and the like separating from the water during such passage rising and flowing upwardly through said channels and out the first end, the sludge, and the like settling from the water during such passage and flowing out the second end, the ends of the plates disposed in the second end forming a plane which lies substantially vertical and substantially coplanar with said one of said walls when said pack is mounted on said inclined wall for substantially reducing clogging of the passageways during separation of the sludge from the water when flowing through said pack, the uppermost part of said pack being above the level of said inlet.

---

**4,213,866**

## COMPOSITION AND PROCESS FOR REMOVING SULFUR SCALE FROM INTERSTICES IN PETROLEUM BEARING FORMATIONS AND THE LIKE TO IMPROVE THE FLOW OF PETROLEUM

**Robert M. Ashby, 3845 Fairmeade Rd., Pasadena, Calif. 91107, and Frederick S. Kaveggia, 24772 Via San Felipe, Mission Viejo, Calif. 92675**

**Continuation of Ser. No. 793,150, May 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 536,336, Dec. 26, 1974, abandoned. This application Nov. 3, 1978, Ser. No. 957,537**

**Int. Cl.[2] E21B *43/27***

**U.S. Cl. 252—8.55 C** **29 Claims**

1. A composition suitable for the essentially complete dissolution of sulfur scale from petroleum passages comprising:

(a) an aqueous acidic solution of a primary acid selected from the class consisting of hydrochloric acid, phosphoric acid, formic acid, citric acid, oxalic acid, and any of said acids intensified with hydrofluoric acid;

(b) minor amounts of a vanadium compound selected from at least one member of the class consisting of vanadium pentoxide, vanadyl sulfate, vanadyl chloride and vanadyl phosphate, the vanadium compound being present in the amount of at least about 0.01 weight percent;

(c) minor amounts of a second acid selected from at least one member of the class consisting of acetic acid, hydroxymalonic acid, dihydroxymalonic acid, malonic acid, and ethylene-diamine-tetraacetic acid; and

(d) the second acid being present in the composition in the amount of at least about 0.5 weight percent.

---

**4,213,867**

## FABRIC CONDITIONING COMPOSITIONS

**Samuel Cukier, and Irshad A. Khan, both of Montreal, Canada, assignors to Domtar Inc., Montreal, Canada**

**Filed Dec. 29, 1978, Ser. No. 362**

**Int. Cl.[2] D06M *13/34, 13/46, 13/38***

**U.S. Cl. 252—8.75** **12 Claims**

1. A homogeneous basic mix for fabric conditioning compositions pumpable at room temperature consisting essentially of:

(a) diluent consisting between about 15 and 35 percent by weight of the base mix,

(b) between about 50 and 60 percent by weight of quaternary ammonium compounds having the general formula $(R_1R_2R_3R_4N^+)X^-$ where $R_1$, $R_2$ represent alkyl groups having 1 to 3 carbon atoms, $R_3$ represents an alkyl group having 12 to 20 carbon atoms, $R_4$ is chosen from the group consisting of alkyl groups having 1 to 3 carbon atoms and alkyl groups having 12 to 20 carbon atoms; and where the anion $X^-$ represents chloride, bromide, nitrate, bisulfate acetate, methylsulfate and ethylsulfate; and

(c) a member chosen from the group consisting of:

(i) fatty alcohols having the general formula ROH, where R is chosen from alkyl groups having between 18 and 28 carbon atoms,

(ii) phosphoric acid esters having the general formula

$$(RO)_m-\overset{\overset{O}{\|}}{P}-(OH)_n,$$

where R is chosen as defined in (i) above, and $m+n=3$ with $m \geqq 1$,

(iii) a mixture of (c) (i) and (c) (ii),

where the weight proportion of component (c) in the base mix can range from about 5 to 30 percent, so as to provide said homogeneous base mix for fabric conditioning compositions, which is pumpable at room temperature.

---

**4,213,868**

## GALVANIC CORROSION PREVENTION COUPLING

**Clarence J. Bitely, Jr., Limestone, N.Y.; Luther D. Dromgold, Bradford, Pa., and William S. Murray, Jr., Rumson, N.J., assignors to Witco Chemical Corporation, New York, N.Y.**

**Filed Oct. 27, 1978, Ser. No. 955,546**

**Int. Cl.[2] C10M *1/24, 3/18, 1/18, 3/12***

**U.S. Cl. 252—11** **13 Claims**

1. An anti-galvanic corrosion coupling, consisting essentially of two dissimilar metals having a grease disposed therebetween, said grease consisting essentially of a hydrocarbon base oil and a stearate gelling agent selected from the class consisting of sodium, lithium and barium stearates.

---

**4,213,869**

## MINIMAL BLOCKING THERMOPLASTIC MATERIAL AND LUBRICATING OIL COMPOSITION CONTAINING THE SAME

**Edward J. Kosinsky, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Apr. 12, 1979, Ser. No. 29,419**

**Int. Cl.[2] C10M *1/24***

**U.S. Cl. 252—37.5** **7 Claims**

1. A lubricating oil composition having a low viscosity index comprising a mineral lubricating oil containing from about 0.5 to about 5.0 percent by volume of conjugated diene-monovinylarene copolymer having incorporated into or onto said copolymer at least one metal salt of a metal selected from

the group consisting of a metal of Group I, II, III or IV of the Periodic Table and a fatty acid having about 8 to about 30 carbon atoms per molecule and a polyhydrocarbylsiloxane silicone compound, the relative amounts of said metal salt and said silicone compound being sufficient to significantly reduce the blocking between contact surfaces of said conjugated diene-monovinylarene copolymer.

---

**4,213,870**

## CLEANING AND LUBRICATING COMPOSITIONS AND METHOD OF USING THE SAME

**Thomas J. Loran, Boulder Canyon, Boulder, Colo. 80302**

**Filed Jul. 29, 1977, Ser. No. 820,351**
**Int. Cl.[2] C10M 1/32**
**U.S. Cl. 252—51.5 R** **16 Claims**

1. A lubricating composition consisting essentially of:

fluorinated alkyl esters including a chemical structure having a fluorinated alkyl hydrophobic tail terminating in a hydrophilic ester group and having the structure

$$R(CF_2)_nCOOR'$$

wherein R is a material selected from the group consisting of H and $CF_3$, R' is a short chain alkyl compound, and n is equal to a positive integer such that the fluorinated alkyl esters have a relatively high molecular weight on the order of at least 300 which are normally solid under ambient conditions; and

another material selected from the group consisting of at least one of tetrafluoroethylene telomers and compatible anti-static agents.

5. The composition of claim 1 wherein the antistatic agent is an amine.

16. The method of lubricating the surface of a plastic material comprising the steps of:

intermixing a fluorinated alkyl ester with a material selected from the group consisting of tetrafluoroethylene telomers and anti-static agents compatible with said fluorinated alkyl esters together with a volatile solvent for the composition, said fluorinated alkyl esters having a fluorinated alkyl hydrophobic tail terminating in a hydrophibic ester group as defined by the structural formula

$$R(CR_2)_nCOOR'$$

wherein R is a material selected from the group consisting H and $CF_3$, R' is a short chain alkyl compound, and n is equal to a positive integer such that the fluorinated alkyl ester has a relatively high molecular weight which is normally solid under ambient conditions; and

applying said intermixture in a thin film to the surface to be lubricated whereby when the solvent evaporates a hard, solid wear-resistant lubricant coating is left upon the surface.

---

**4,213,871**

## BIOLOGICAL ACTIVATORS

**Tristan Bavaveas, Paris, France, assignor to Societe Anonyme dite:EPARCO, France**

**Filed Jul. 6, 1977, Ser. No. 813,231**
**Claims priority, application France, Jul. 6, 1976, 76 20586**
**Int. Cl.[2] C09K 3/00**
**U.S. Cl. 252—60** **7 Claims**

1. A biological activator for septic tanks useful for increasing the bacteria therein consisting essentially of 50 to 90% silica in the form of $SiO_2$, 3 to 30% aluminum in the form of $Al_2O_3$ and 1 to 4% of iron in the form of $Fe_2O_3$ and 1 to 4% calcium in the form of $CaCO_3$ and at least one trace element selected from the group consisting of bismuth, cesium, titanium, copper, manganese, barium, cobalt, germanium, tin, zinc, beryllium, chromium and strontium, said activator being a non-corrosive mineral composition in finely divided form, nontoxic to bacteria, the majority of the particles of said composition having a particle size of less than about 50 microns and having a specific surface of about 4500 to 9000 $cm.^2/g.$ such as to provide a base for the anaerobic microbic flora thereby providing for an increase in the density of bacteria in the septic tank or an equivalent quantity of nutriment.

---

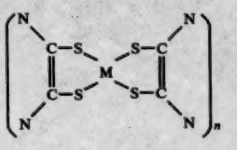
**4,213,872**

## SLUDGE RESISTANT LIQUID DEVELOPER FOR ELECTROSTATIC IMAGES CONTAINING A METAL-DITHIOOXAMIDE PIGMENT OR COATING

**Robert N. Cooper, Skokie, Ill., assignor to A. B. Dick Company, Niles, Ill.**

**Filed Jul. 17, 1978, Ser. No. 925,115**
**Int. Cl.[2] G03B 9/12**
**U.S. Cl. 430—114** **7 Claims**

1. A liquid developer composition for visual development of latent electrostatic images comprising an inert liquid carrier and a compound having the general formula



in which M is a metal selected from the group consisting of nickel, cobalt, copper and iron and n is a whole number in which the compound in finely divided form is dispersed as a toner or part thereof in the carrier in an amount within the range of 2–20 parts by weight per 100 parts by weight of liquid carrier.

---

**4,213,873**

## WATER BASED WINDOW, GLASS AND CHROME CLEANER COMPOSITION

**Peter K. Church, Cascade, Colo., assignor to Leisure Products Corporation, Cascade, Colo.**

**Filed Mar. 10, 1978, Ser. No. 885,311**
**Int. Cl.[2] C11D 3/43, 1/72**
**U.S. Cl. 252—174.21** **14 Claims**

1. A water based cleaning composition consisting essentially of water on the order of about 59.3 to about 99.58 weight percent, a cleaning agent selected from the group consisting of ammonium hydroxide, a monohydroxy alcohol containing not more than 3 carbon atoms and mixtures thereof on the order of about 0.31 to about 40.3 weight percent plus an amount of at least one lubricity compound selected from the group consisting of a water soluble polymer of ethylene glycol having at least 16 carbon atoms according to the formula $ROCH_2(CH_2OCH_2)_n CH_2OR$ having a molecular weight of at least 380 wherein n is at least seven and R is a radical selected from the group consisting of $H^+$ and $CH_3^+$ ammonium carbonate, ammonium bicarbonate and mixtures thereof on the order of about 0.025 to about 0.3 weight percent to impart substantial lubricity to the composition.

---

**4,213,874**

## SYNTHETIC AMORPHOUS SODIUM ALUMINOSILICATE BASE EXCHANGE MATERIALS

**Lloyd E. Williams, Bel Air, and Robert K. Mays, Havre de Grace, both of Md., assignors to J. M. Huber Corporation, Rumson, N.J.**

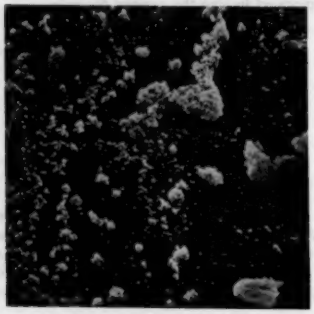
**Continuation of Ser. No. 622,585, Oct. 15, 1975, abandoned, which is a division of Ser. No. 522,375, Nov. 8, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 872,968**
**Int. Cl.[2] C01B 33/28; C02B 1/44; C11D 3/12, 3/14**
**U.S. Cl. 252—174.25** **1 Claim**

1. A washing composition comprising a synthetic detergent surfactant including as an ion exchange and water softening

agent, a synthetic finely divided amorphous sodium aluminosilicate, said sodium aluminosilicate having the chemical composition

$$Na_2O.Al_2O_3.2.0\text{-}3.8SiO_2.XH_2O$$

wherein X has a value of 3 to 6, the primary particles of said aluminosilicate being spherical and in the 400–500 A range, said particles accreting into stable aggregates of irregular shapes and sizes ranging from 2000–5000 A, said aluminosilicate having an oil absorption of at least 75 cc/100 gms, a pack density of greater than 10 pounds per cubic foot, a pour density in the range of 9.0 to 9.2 lb/ft$^3$, a mercury intrusion void of greater than 2.0 cc/gm, a base exchange capacity of at least 255 mg $CaCO_3$/gm, and a water softening rate of at least 3.2 grains per gallon per minute; said softening agent being added at a



0.06% level to mixed Ca-Mg hard water with 7.0 gr./gal hardness; said sodium aluminosilicate ion exchange and water softening agent being present in said composition in sufficient amounts to provide a weight ratio of detergent surfactant to aluminosilicate of about 25:1 to 25:5, respectively; said amorphous sodium aluminosilicate being produced by the steps of: preparing an aqueous solution of 4 molar or lower sodium silicate, said silicate having a $SiO_2/Na_2O$ mole ratio of from about 2.2 to 2.8, subjecting said solution to vigorous agitation and adding to said silicate solution a dilute solution of sodium aluminate, said sodium aluminate having a $Na_2O/Al_2O_3$ mole ratio of from 1.0 to 6.0; continuing the vigorous agitation of the reaction mass formed by the addition of said sodium aluminate to said sodium silicate solution at a precipitating temperature of about 25°–70° C.; and maintaining the pH of said reaction mass at a level of at least 10.5 to thereby precipitate the finely divided amorphous sodium aluminosilicate.

---

**4,213,875**

**SYNTHESIZED SCENT**

**Arthur F. Isbell, Bryan, Tex., assignor to Meiller Research, Inc., College Station, Tex.**

**Filed Mar. 13, 1978, Ser. No. 885,941**

**Int. Cl.$^2$ C07C *157/2;* C09K *3/00***

**U.S. Cl. 252—188.3 R** **11 Claims**

1. A kit for synthesizing a scent substantially similar to that produced in the anal glands of skunks and for masking human odor from detection by wild animals, consisting essentially of a first component comprising an aqueous solution of a trans-crotyl isothiuronium salt and a second component comprising an aqueous solution of base, that when combined yield trans-2-butene-1-thiol.

**4,213,876**

**MULTI-PURPOSE BLOOD DILUENT FOR USE IN ELECTRONIC BLOOD ANALYSIS INSTRUMENTATION**

**Harold R. Crews, Miami; Dave Chastain, Jr., Ft. Lauderdale, and Stephen L. Ledis, Hialeah, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.**

**Filed Aug. 22, 1978, Ser. No. 936,570**

**Int. Cl.$^2$ G01N *33/16;* C09K *3/00***

**U.S. Cl. 252—408** **8 Claims**

1. A multi-purpose blood diluent suitable for use in electronic enumeration and sizing of blood cells, determination of hemoblobin concentration and their collective indices and platelet parameters in a single blood sample by means of electronic instrumentation comprising:

A. an osmotically balanced solution of sodium chloride, a monobasic phosphate salt, a dibasic phosphate salt and sodium sulfate,

B. a bacteriostatic agent comprising a hydroxyquinoline, and

C. a hydrochloride compound selected from the family of anesthetic compounds compatible with said baceteriostatic agent for maintaining desired red blood cell morphology during operation of said instrumentation ; and

D. said diluent being an aqueous electrolytic solution maintained within a preselected range of pH and osmolality.

---

**4,213,877**

**METHOD OF REACTIVATING A CATALYTIC COMPOSITE OF AN ADSORPTIVE CARRIER MATERIAL AND A MERCAPTAN OXIDATION CATALYST**

**Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Dec. 26, 1978, Ser. No. 973,303**

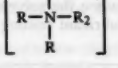
**Int. Cl.$^2$ B01J *31/40***

**U.S. Cl. 252—412** **14 Claims**

1. A method of reactivating a deactivated catalytic composite of an adsorptive carrier material and a metal chelate mercaptan oxidation catalyst which has become deactivated in mercaptan oxidation, which comprises washing the thus deactivated composite with an aqueous quaternary ammonium compound solution at a temperature of from about 55°–175° C.

2. The method of claim 1 further characterized in that said metal chelate mercaptan oxidation catalyst is a metal phthalocyanine.

6. The method of claim 1 further characterized in that said quaternary ammonium compound is represented by the structural formula



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl, $R_1$ is a substantially straight chain alkyl radical containing from about 5 to about 20 carbon atoms, $R_2$ is selected from the group consisting of aryl, aralkyl and alkaryl, and X is an anion.

---

**4,213,878**

**TRANSITION METAL COMPOSITION AND PROCESS**

**Ashley D. Bye, The Hague, Netherlands, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Aug. 25, 1978, Ser. No. 936,897**

**Claims priority, application United Kingdom, Aug. 31, 1977, 36342/77**

**Int. Cl.$^2$ C08F *4/64***

**U.S. Cl. 252—429 B** **9 Claims**

1. A process for the production of a titanium trichloride-containing composition which process comprises

(1) reducing titanium tetrachloride by reacting the titanium tetrachloride with a reducing agent under conditions to give a titanium trichloride product which includes an associated aluminium compound containing aluminium and chlorine atoms, wherein the titanium trichloride is formed predominantly in the beta-form;

(2) contacting the reduction product with both compound E and compound L, compound L being added after the addition of compound E so that both compound E and compound L are present together, at least part of the contacting being effected at a temperature of at least 60° C. in the presence of at least compound E; and

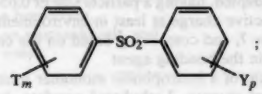
(3) washing the product obtained with an inert hydrocarbon or inert halohydrocarbon liquid

wherein

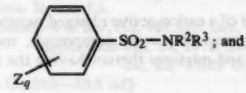
E is an ether or a thioether;

L is an organic sulphur-containing compound of one of the formulae (1), (2) or (3);

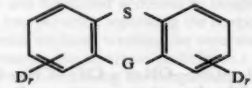
formula (1) is



formula (2) is



formula (3) is



where

T, or each T is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $-NR^1R^2$, or two groups T can together form a saturated or unsaturated hydrocarbon ring;

Y, or each Y is, independently, a halogen atom; an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $-NR^1R^2$, or two groups Y can together form a saturated or unsaturated hydrocarbon ring; or a group T and a group Y may be replaced by a link between the two phenyl groups attached to the $-SO_2-$ group, the linkage being either direct or through a group —O—, $-CH_2-$, $-NR^1-$, —S— or —CO—.

Z, or each Z is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $-NR^1R^2$, or two groups Z can together form a saturated or unsaturated hydrocarbon ring;

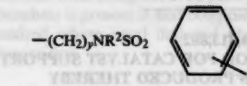
D, or each D is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $-NR^1R^2$;

G is —S—, —O—, $-NR^2-$ or —CO—;

$R^1$ is a hydrogen atom or a hydrocarbyl group;

$R^2$ is a hydrocarbyl group;

$R^3$ is a hydrocarbyl group or can be a group



m, p, q and r are each, independently, an integer from 0 up to 5; and

y is a positive integer.

---

**4,213,879**

## CATALYST COMPOSITION

**Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 827,632, Aug. 25, 1977, Pat. No. 4,164,615. This application Mar. 1, 1979, Ser. No. 16,752**

**Int. Cl.² B01J *27/08, 27/10***

**U.S. Cl. 252—429 R** **24 Claims**

1. A composition comprising (A) a trivalent or tetravalent titanium compound wherein said titanium compound is a hydrocarbyl titanium compound or a hydrocarbyl titanium halide, (B) an alkali metal compound, and (C) an inorganic halide ion source, wherein said halide of said (A) or (C) is chloride, bromide, or iodide; optionally (D) a dihalobutene; and optionally (E) in admixture with carboxylic acid media;

wherein said (B) alkali metal compound is an alkali metal halide, nitrate, carboxylate, oxide, hydroxide, or mixture; said (C) can be supplied at least in part by said (A) titanium compound, said (B) alkali metal compound, or both; and molar ratios of (B) and (A) of about 0.1:1 to 20:1, and of said (C) as the halide ion to (A) of about 0.1:1 to 20:1.

---

**4,213,880**

## HYDROCARBON SOLUTIONS OF ORGANOMAGNESIUM COMPOUNDS

**George W. Knight, Lake Jackson, and Dennis E. Mach, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Sep. 11, 1975, Ser. No. 612,397**

**Int. Cl.² B01J *31/12***

**U.S. Cl. 252—431 R** **13 Claims**

1. A solution of a diorganomagnesium component suitable as an organometallic component in the preparation of a Ziegler catalyst for the polymerization of α-olefins which solution comprising a diorganomagnesium compound, a liquid hydrocarbon solvent, a solubilizing compound selected from the group consisting of an organozinc, organoboron or mixtures thereof in an amount sufficient to solubilize the diorganomagnesium compound and an agent that reduces the viscosity of the solution without destroying the solution or any component thereof in an amount sufficient to facilitate separation of suspended solids from the solution.

---

**4,213,881**

## REFORMING WITH MULTIMETALLIC CATALYSTS

**Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation-in-part of Ser. No. 862,116, Dec. 19, 1977, Pat. No. 4,151,115, and Ser. No. 862,114, Dec. 19, 1977, Pat. No. 4,148,758, each is a continuation-in-part of Ser. No. 826,996, Aug. 23, 1977, abandoned. This application Dec. 14, 1978, Ser. No. 969,548**

**Int. Cl.² B01J *27/02***

**U.S. Cl. 252—436** **9 Claims**

1. In a process for preparing a reforming catalyst wherein a Group VIII noble metal hydrogenation-dehydrogenation component, a component comprised of iridium or rhenium, or both, and a halogen component are composited with an inorganic oxide support, the improvement which comprises incorporating selenium, sulfurous acid or sulfuric acid, or both, as

components within said catalyst sufficient to increase the activity, or selectivity, or both.

---

**4,213,882**

**PREPARATION METHOD FOR CATALYST SUPPORT AND MATERIALS PRODUCED THEREBY**

**Herbert Kranich, Jr., Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.**

**Filed Aug. 9, 1976, Ser. No. 712,633**

**Int. Cl.[2] B01J *29/06, 35/00***

**U.S. Cl. 252—455 R** **9 Claims**

1. A process for the formation of a siliceous catalyst support which comprises:

(a) forming a mixture consisting essentially of, in parts by weight:

natural diatomite—60–65 parts

bentonite clay—18–22 parts

corn meal—15–20 parts

and sufficient water to impart an extrudable consistency;

(b) extruding said mixture through a die to form an extrudate and then separating said extrudate into a plurality of pellets;

(c) drying said pellets for at least about 20 minutes at a temperature of at least about 150° F., the time and temperature being selected such that all moisture is removed; and

(d) calcining said dried pellets at a temperature of at least about 1150° F. for at least about 30 minutes, until said corn meal is substantially completely removed from said pellets leaving a highly porous solid fused composite pellet of diatomite and clay.

---

**4,213,883**

**METHOD FOR MANUFACTURE OF NEUTRON ABSORBING ARTICLES**

**Dean P. Owens, Tonawanda, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.**

**Filed Dec. 30, 1977, Ser. No. 866,102**

**Int. Cl.[2] C04B *35/68***

**U.S. Cl. 252—478** **10 Claims**

1. A one-step curing method for the manufacture of a neutron absorbing article which comprises irreversibly curing, in desired article form, a form-retaining mixture of boron carbide particles, curable phenolic resin in solid state and in particulate form and a minor proportion of a liquid medium, which boils at a temperature below 200° C., at an elevated temperature so as to obtain bonding of the irreversibly cured phenolic polymer resulting to the boron carbide particles and production of the neutron absorbing article in desired form.

---

**4,213,884**

**MANUFACTURE OF A HIGHLY CONCENTRATED AQUEOUS SOLUTION OF A DICARBOXYLIC ACID DIAMINE SALT AND A NYLON PRECONDENSATE**

**Albrecht Eckell, Frankenthal; Paul Matthies, Heidelberg; Georg Pilz, Neustadt, and Rudi-Heinz Rotzoll, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jun. 8, 1978, Ser. No. 913,641**

**Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728817**

**Int. Cl.[2] C08G *69/28*; C07C *51/52***

**U.S. Cl. 260—29.2 N** **6 Claims**

1. A process for the manufacture of highly concentrated aqueous solution of a salt of an alkanedicarboxylic acid of 6 to 12 carbon atoms and an alkane diamine of 6 to 12 carbon atoms which process consists essentially of:

adding molten alkane diamine to an aqueous solution containing from about 40 to 65% by weight of said salt and containing an excess amount of the dicarboxylic acid at a temperature of from 60° to 110° C., the amount of said molten alkane diamine being equivalent to the amount of dissolved dicarboxylic acid, and

allowing the final reaction temperature to rise to from 160° to 200° C. under super atmospheric pressure,

whereby a highly concentrated solution containing from 70 to 90% by weight of said salt and a nylon precondensate of the salt is formed.

---

**4,213,885**

**BONDING AGENT FOR SHEET-FORMED FIBRE PRODUCTS**

**Anders Boberg; Bernt Larsson, and Folke Lundh, all of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden**

**Filed Jun. 16, 1978, Ser. No. 916,177**

**Claims priority, application Sweden, Jun. 23, 1977, 7707295**

**Int. Cl.[2] C08L *33/14***

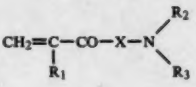
**U.S. Cl. 260—29.6 TA** **13 Claims**

1. An aqueous composition for preparing sheet-formed fibrous products comprising water suspended fibrous material and 0.5–20 percent by weight calculated as dry polymer based on dry fibre of a bonding agent comprising a particle-shaped polymer product dispersed in water and being produced through emulsion polymerization in the presence of an emulsifying system thereto adapted, having a particle size of 0.05–0.3 μm, having a cation-active charge at least in environments in which the pH is below 7, and comprising based on the entire quantity of monomer in the bonding agent

(a) 95–65% by weight of a hydrophobic monomer selected from the group of styrene, 2-ethyhexyl acrylate, butyl acrylate and mixtures thereof;

(b) 3–30% by weight of a hydrophilic monomer selected from the group of acrylamide, methacrylamide, acrylonitrile, 2-hydroxyethyl methacrylate, vinyl pyrrolidone and mixtures thereof;

(c) 0.5–5.0% by weight of a cation-active charged monomer selected from the group of acrylic compounds, methacrylic compounds, and mixtures thereof having the formula:



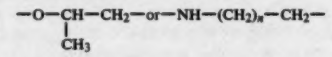
in which

$R_1$=H or $CH_3$

$R_2$=$C_1$—to $C_4$ alkyl, —$CH_2$—OH or —$CH_2$—$CH_2$—OH

$R_3$=—H or either of the alternatives according to $R_2$ and

X=—O—$CH_2$—$CH_2$—, —O—$CH_2$—$CH_2$—$CH_2$—,



in which n=0 to 3.

---

**4,213,886**

**TREATMENT OF ALUMINUM FLAKE TO IMPROVE APPEARANCE OF COATING COMPOSITIONS**

**Robert L. Turner, Troy, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 800,065, May 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 588,609, Jun. 20, 1975, abandoned. This application Oct. 30, 1978, Ser. No. 955,649**

**Int. Cl.[2] C08K *9/04, 9/06***

**U.S. Cl. 260—29.6 MM** **5 Claims**

1. An improvement in water based coating compositions containing aluminum flake, the improvement comprising:

utilizing a coated aluminum flake;

wherein the aluminum flake was coated with at least 100% of the quantity required to form a monolayer on the sur-

face area of the flake of mono-ethylenically unsaturated silane and was reacted with acrylic monomers having functional groups to form an acrylic topcoat on the flake; wherein the silane is selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, vinyltris (beta-methoxyethoxysilane) and gamma-methacryloxypropyltrimethoxysilane.

---

4,213,887

## LITHOGRAPHIC PLATE FINISHER

John E. Walls, Annandale, and Thomas N. Gillich, Readington Township, Hunterdon County, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 16, 1979, Ser. No. 58,235
Int. Cl.[2] C08L *3/02, 39/06*
U.S. Cl. 260—29.6 E 12 Claims

1. An aqueous lithographic plate finisher comprising
a. an hydrophilic polymer selected from the group consisting of a substantially cold water-soluble dextrin and polyvinyl pyrrolidone,
b. at least one nonionic surfactant having an hydrophile-lipophile balance of between about 12 and 18 either for an individual such surfactant or a blend thereof,
c. a humectant,
d. an inorganic salt, and
e. water.

---

4,213,888

## PARTICULATE ELASTOMERIC MATERIALS AND METHOD

Rudolph F. Karg, and Harold J. Gros, both of Baton Rouge, La., assignors to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

Continuation of Ser. No. 747,923, Dec. 6, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,825
Int. Cl.[2] C08F *6/22*
U.S. Cl. 260—33.6 AQ 21 Claims

1. In the preparation of free flowing particles of elastomeric polymers formed of monomers which are polymerizable in aqueous medium in the presence of an emulsifying agent to form a latex, the steps of coagulating the latex by control of one or more of the conditions of agitation, pH, temperature, time and flocculant additions to coagulate the formed elastomer into particles, separating the coagulated particles from the aqueous medium, washing the separated coagulated particles, dewatering the separated particles to a moisture content of less than 65%, screening the coagulated particles to subdivide the particles into an undersize of less than 0.5 mm and an oversize of more than 5 mm, and a product within the range of 0.5 to 5 millimeters in cross-section, and then drying and cooling the separated product particles while in a fluidized state in a continuous sequence of stages initially with hot gases for the removal of moisture and then with cooling gases to reduce the dried particles to a temperature below 120° C. and a moisture content below 3% by weight to minimize sticking, and admixing a solid partitioning agent with the dried particles in an amount within the range of 1–10% by weight to coat the surfaces of the dried particles to obstruct agglomeration between the dried particles.

---

4,213,889

## FLAME RESISTANT RESIN COMPOSITIONS

Harry H. Beacham, Langhorne, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 859,838, Dec. 12, 1977. This application Feb. 13, 1979, Ser. No. 11,739
Int. Cl.[2] C08K *5/52*
U.S. Cl. 260—45.7 PH 6 Claims

1. A flame resistant styrene-unsaturated polyester resin composition comprising said styrene-unsaturated polyester resin in combination with diallyl maleate and about 10 parts per hundred of an alkyl phosphate selected from the group consisting of octyl diphenyl phosphate and tributyl phosphate; the amount of diallyl maleate present in said styrene-unsaturated polyester resin being about 30 parts per hundred when tributyl phosphate is present in said composition and about 40 parts per hundred where octyl diphenyl phosphate is present in said composition.

---

4,213,890

## PREPARATION OF TEREPHTHALOYL-TEREPHTHAL/OXAL COPOLYHYDRAZIDE CONTAINING ZINC COMPOUND

Walter Brodowski, Amorbach, and Michael Wallrabenstein, Worth am Main, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 4, 1978, Ser. No. 948,494
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744621
Int. Cl.[2] C08K *3/10*
U.S. Cl. 260—45.75 W 3 Claims

1. A process for the production of a flame resistant film or fiber, comprising reacting a film or fiber of a terephthaloyl-terephthal/oxal copolyhydrazide having a mole ratio of oxalic acid dihydrazide to terephthalic acid dihydrazide structural units ranging between 19:6 and 6:19 with a solution of one or more inorganic or organic zinc salts to produce the metal chelate of said copolyhydrazide film or fiber and thereafter reacting and dechelating said metal chelate film or fiber with a solution of oxalic acid to obtain a low solubility zinc compound containing copolyhydrazide film or fiber.

---

4,213,891

## THERMOFORMABLE, HIGH IMPACT LOW-SMOKE PLASTIC

George H. Wear, Mogadore, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 940,424, Sep. 7, 1978, abandoned, which is a continuation of Ser. No. 759,924, Jan. 17, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,417
Int. Cl.[2] C08L *23/28, 27/24, 33/08, 51/00*
U.S. Cl. 260—45.75 S 3 Claims

1. In a high impact resistant plastic which is fire resistant when heated to flame temperature, comprising a blend of 100 parts by weight of a chlorinated polyvinyl chloride resin having an average molecular weight of from about 50,000 to 140,000; and from about 5 to 30 parts by weight of chlorinated polyethylene, the improvement comprising the chlorinated polyethylene comprising a heterogeneous mixture of from 50% to 95% of a chlorinated polyethylene having a molecular weight of at least 100,000 and a chlorine content of 30% to 45% and from 5% to 50% of the mixture being a low molecular weight chlorinated polyethylene of from 20,000 to 40,000 and having a chlorine content of from 25% to 45%; from about 10 to 20 parts by weight of a cross-linked alkyl acrylate polyvinyl chloride graft copolymer and from about 1 to 10 parts of an organo tin process aid and heat stabilizer, the combination of the graft copolymer, the process aid, and the chlorinated polyethylenes rendering sheets of the plastic thermoformable.

---

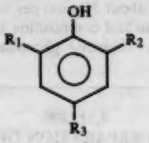
4,213,892

## PROCESS FOR PREPARING OXIDATIVELY-STABLE POLYMERS BY REACTION WITH ANTIOXIDANT IN THE PRESENCE OF FREE RADICAL

Gerald Scott, 338 Station Rd., Knowle, Warwickshire, England

Filed Mar. 5, 1975, Ser. No. 555,678
Claims priority, application United Kingdom, Mar. 6, 1974, 10086/74; Jul. 11, 1974, 30870/74
Int. Cl.[2] C08K *5/05*
U.S. Cl. 260—45.95 C 11 Claims

1. A process for preparing an oxidatively stable polymer which comprises reacting the polymer with an antioxidant of the formula:



in which $R_1$ and $R_2$ each independently represents a hydrogen atom or a tertiary alkyl radical such that at least one represents a tertiary alkyl radical and $R_3$ represents a hydrogen atom or an alkyl, hydroxy, hydroxyalkyl, alkoxyalkyl or mercaptoalkyl radical, said R radicals optionally being substituted by aromatic phenolic or aromatic amine groups, in the presence of a free radical with the proviso that when the free radical is produced by a free radical generator, said generator produces free radicals at a temperature below about 120° C.

---

**4,213,893**

**FLAVIN ADENINE DINUCLEOTIDE-LABELED CONJUGATES FOR USE IN SPECIFIC BINDING ASSAYS**

**Robert J. Carrico, and Richard D. Johnson, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.**

**Continuation-in-part of Ser. No. 917,962, Jun. 22, 1978. This application Oct. 12, 1978, Ser. No. 950,858**

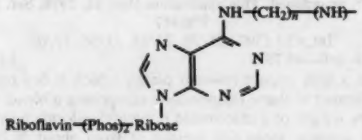
**Int. Cl.**[2] **C07C** *103/52;* **C07G** *7/00;* **A61K** *37/00;* **C07H** *19/16*

**U.S. Cl. 260—112.5 R** **42 Claims**

1. In a labeled conjugate for use in specific binding assays of the general formula:

labeling substance(NH-)(CO)L

wherein -(CO)L is a hapten of molecular weight greater than 100 or an antigenic polypeptide or protein bound to said labeling substance through an amide bond, characterized in that said labeling substance (NH-)- has the formula:



wherein Riboflavin-(Phos)$_2$-Ribose represents the riboflavin-pyrophosphate-ribose residue in flavin adenine dinucleotide and n=2 through 6.

---

**4,213,894**

**DIPHENYLHYDANTOIN IMMUNOGEN CONJUGATES**

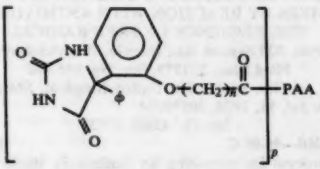
**Robert T. Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Division of Ser. No. 899,844, Apr. 25, 1978. This application Dec. 7, 1978, Ser. No. 967,132**

**Int. Cl.**[2] **C07C** *103/52;* **C07G** *7/00;* **A61K** *37/100*

**U.S. Cl. 260—112.5 R** **3 Claims**

1. A diphenylhydantoin immunogen conjugate of the formula:



wherein $\phi$ is phenyl, PAA is an immunogenic polypeptide or protein having a molecular weight of at least 5,000 bonded through an amide linkage, n=2 through 6, and p=1 through 50.

---

**4,213,895**

**N-[N-[N-[N-(5-OXO-L-PROLYL)-L-HISTIDYL]-L-TRYPTOPHYL]-L-SERYL]-L-TYROSYL]GLYCINE AZIDE, AN INTERMEDIATE OF THE RELEASING AGENT OF LUTEINIZING HORMONE (LW) AND OF FOLLICLE STIMULATING HORMONE (FSH)**

**Hans U. Immer, Mount Royal; Verner R. Nelson, Kirkland, and Menfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 456,343, Mar. 29, 1974, Pat. No. 4,159,980, which is a division of Ser. No. 226,508, Feb. 15, 1972, Pat. No. 3,835,108. This application Mar. 26, 1979, Ser. No. 23,563**

**Int. Cl.**[2] **C07C** *103/52;* **A61K** *37/00*

**U.S. Cl. 260—112.5 R** **1 Claim**

1. N-[N-[N[N-[N-(5-Oxo-L-prolyl)-L-histidyl]-L-tryptophyl]-L-seryl]-L-tyrosyl]glycine azide.

---

**4,213,896**

**RENNET CASEIN AND METHOD FOR TREATMENT THEREOF**

**Paul F. Davis, Addison, Ill., assignor to Kraft, Inc., Glenview, Ill.**

**Filed Apr. 26, 1979, Ser. No. 33,388**

**Int. Cl.**[2] **A23J** *1/20*

**U.S. Cl. 260—119** **6 Claims**

1. A method for treatment of rennet casein to provide a casein product with water binding properties comprising adding rennet casein to water to provide a casein dispersion, adding an orthophosphate salt of a monovalent cation to said dispersion, agitating said dispersion to solubilize said casein and adding a magnesium salt to said dispersion containing said rennet casein and said orthophosphate salt so as to cause partial destabilization and precipitation of said rennet casein.

---

**4,213,897**

**DISAZO AND TRISAZO COMPOUNDS HAVING A 3-PYRIDINIUM OR SUBSTITUTED PYRIDINIUM-4-METHYL-6-HYDROXYPYRIDONE-2 COUPLING COMPONENT RADICAL**

**Helmut Moser, Oberwil, and Hans R. von Tobel, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland**

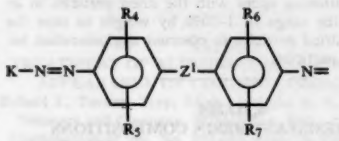
**Filed Mar. 8, 1978, Ser. No. 884,413**

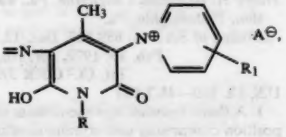
**Claims priority, application Switzerland, Mar. 14, 1977, 3158/77**

**Int. Cl.**[2] **C09B** *35/20, 35/22, 35/24, 35/32*

**U.S. Cl. 260—154** **51 Claims**

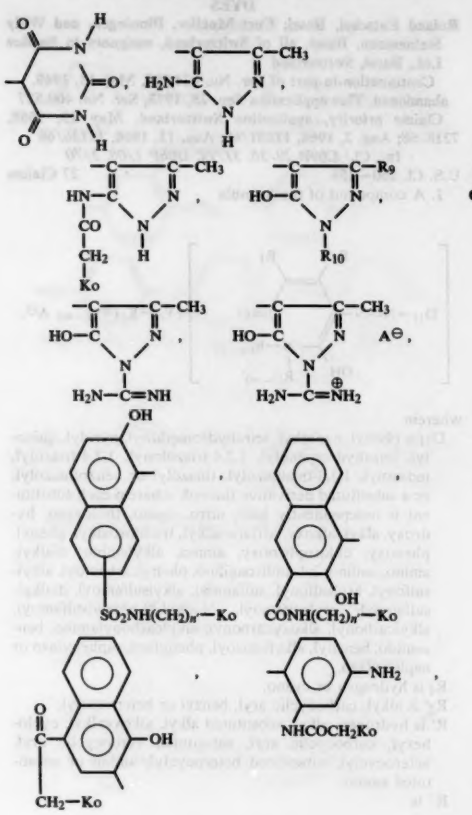
1. A compound of the formula

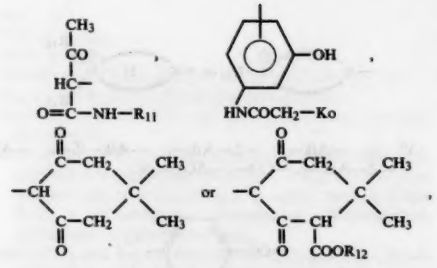




wherein

K is

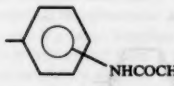




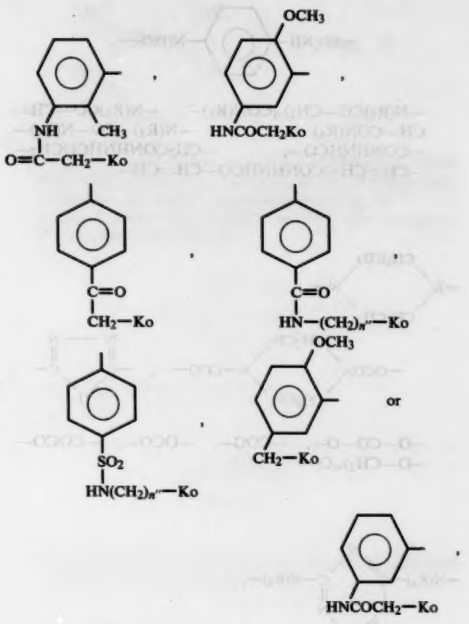
wherein

$R_9$ is methyl or $-CONH-(CH_2)_{n'}-Ko$, wherein n' is 2 or 3,

$R_{10}$ is hydrogen, phenyl or



$R_{11}$ is



wherein n'' is 2 or 3,

$R_{12}$ is $C_{1-4}$alkyl, and

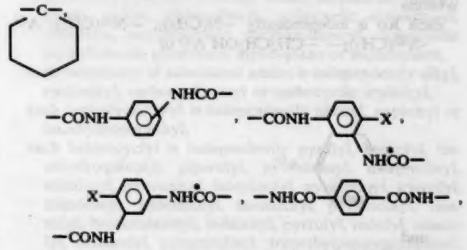
n' is 2 or 3,

R is hydrogen, $C_{1-4}$alkyl, $C_{2-4}$hydroxyalkyl the hydroxy group of which is on other than the α—carbon atom di-($C_{1-4}$alkyl)amino or $-(CH_2)_n-Ko$, wherein n is 2 or 3,

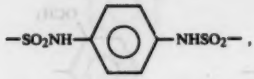
$R_1$ is hydrogen, $C_{1-4}$alkyl, $C_{1-4}$hydroxyalkyl or $C_{1-4}$alkoxy,

each of $R_4$, $R_5$, $R_6$ and $R_7$ is independently hydrogen, halo, $C_{1-4}$alkyl or $C_{1-4}$alkoxy, with the proviso that not more than two of $R_4$, $R_5$, $R_6$ and $R_7$ are halo and not more than two of $R_4$, $R_5$, $R_6$ and $R_7$ are selected from $C_{1-4}$alkyl and $C_{1-4}$alkoxy, and

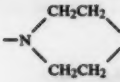
Z is a direct bond, straight or branched $C_{1-4}$alkylene, —CO—, —NHCSNH—, —S—, —O—, —CH=CH—, —S—S—, $-SO_2-$, —NH—, —NHCO—, —CONH—, $-N(CH_3)-CO-$, $-CON(CH_3)-$,

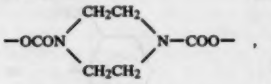


$-SO_2NH-$, $-NHSO_2-$,

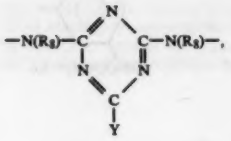


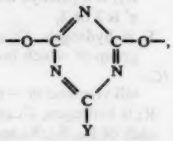
—$N(R_8)CO—(CH_2)_mCON(R_8)$—, —$N(R_8)CO—CH$=$CH—CON(R_8)$—, —$N(R_8)—CO—N(R_8)$—, —$CONHNHCO$—, —$CH_2CONHNHCOCH_2$—, —$CH$=$CH—CONHNHCO—CH$=$CH$—,





—$O—CO—O$—, —$COO$—, —$OCO$—, —$COCO$—, —$O—(CH_2)_mO$—,





—$CON(R_8)(CH_2)_mN(R_8)CO$—, —$CON(R_8)—(CH_2)_mO—(CH_2)_mN(R_8)CO$—, —$CON(R_8)—(CH_2)_mN(CH_3)—(CH_2)_mN(R_8)CO$—, —$CON(R_8)—(CH_2)_mO—(CH_2)_mO—(CH_2)_mN(R_8)CO$— or —N=N—,

wherein

each $R_8$ is independently hydrogen or n-$C_{1-4}$alkyl,

X is halo, n-$C_{1-4}$alkyl or n-$C_{1-4}$alkoxy,

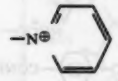
Y is halo, —$NHCH_2CH_2OH$ or —$N(CH_2CH_2OH)_2$,

each m is independently 1, 2, 3 or 4, and

the * indicates the atom of Z bound to the 1-position,

wherein

each Ko is independently —$N(CH_3)_2$, —$N^{\oplus}(CH_3)_3$ $A^{\ominus}$, -$N^{\oplus}(CH_3)_2$— —$CH_2CH_2OH$ $A^{\ominus}$ or



and

each $A^{\ominus}$ is independently an anion,

with the proviso that the maximum number of Ko groups is 2.

## 4,213,898

## CATIONIC 5-ARYLAZO-6-HYDROXYPYRIDONE-2 DYES

**Roland Entschel, Basel; Curt Mueller, Binningen, and Willy Steinemann, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland**

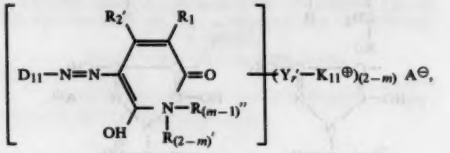
**Continuation-in-part of Ser. No. 824,298, May 13, 1969, abandoned. This application Sep. 25, 1973, Ser. No. 400,527**

**Claims priority, application Switzerland, May 15, 1968, 7218/68; Aug. 2, 1968, 11581/68; Aug. 13, 1968, 12136/68**

**Int. Cl.[2] C09B *29/36, 31/14;* D06P *1/08, 3/70***

**U.S. Cl. 260—156** **27 Claims**

1. A compound of the formula



wherein

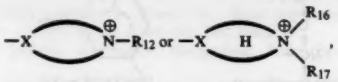
$D_{11}$ is phenyl, naphthyl, tetrahydronaphthyl, pyridyl, quinolyl, tetrahydroquinolyl, 1,2,4-triazolonyl, 1,2,4-triazolyl, indazolyl, 1,3,4-thiadiazolyl, thiazolyl or benzothiazolyl, or a substituted derivative thereof, wherein each substituent is independently halo, nitro, cyano, thiocyano, hydroxy, alkyl, alkoxy, trifluoroalkyl, trichloroalkyl, phenyl, phenoxy, chlorophenoxy, amino, alkylamino, dialkylamino, anilino, 2,4-dinitroanilino, phenylcarbamoyl, alkylsulfonyl, arylsulfonyl, sulfamoyl, alkylsulfamoyl, dialkylsulfamoyl, arylsulfamoyl, N-alkyl-N-phenylsulfamoyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonylamino, benzamido, benzoyl, alkylbenzoyl, phenylazo, diphenylazo or naphthylazo,

$R_1$ is hydrogen or cyano,

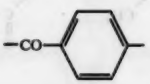
$R_2'$ is alkyl, carbocyclic aryl, benzyl or heterocyclyl,

R′ is hydrogen, alkyl, substituted alkyl, alkoxyalkyl, cyclohexyl, carbocyclic aryl, substituted carbocyclic aryl, heterocyclyl, substituted heterocyclyl, amino or substituted amino,

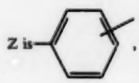
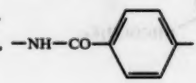
R″ is



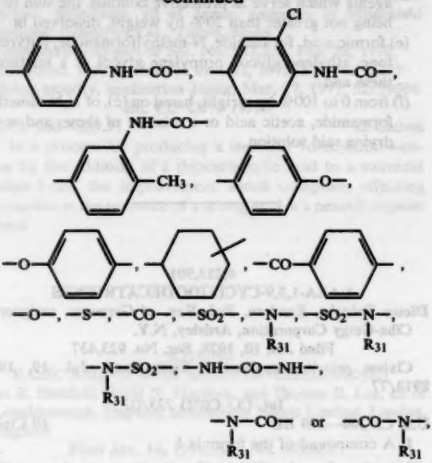
Y′ is —Alk—, —Z—Alk—, —Alk—Z—, —Alk′—Z—Alk′—, —CO—, —$SO_2$— or



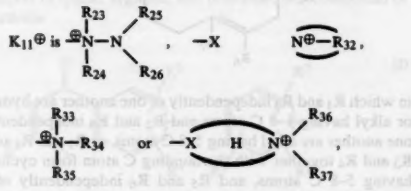
wherein Alk is straight or branched chain alkylene of 1 to 12 carbon atoms or straight or branched chain alkylene of 1 to 12 carbon atoms substituted by hydroxy, each Alk′ is independently straight or branched chain alkylene, with the proviso that the two Alk′ radicals together contain 2 to 12 carbon atoms, and

Z is  , —NH—CO—  ,

-continued



wherein $R_{31}$ is hydrogen or alkyl,



m is 1 or 2,

r is 0 or 1, and

$A^{\ominus}$ is an anion,

wherein $R_{12}$ is hydrocarbyl or substituted hydrocarbyl,

$R_{16}$ is hydrocarbyl or substituted hydrocarbyl,

$R_{17}$ is hydrocarbyl, substituted hydrocarbyl, amino or substituted amino,

each of $R_{23}$ and $R_{24}$ is independently alkyl, substituted alkyl, cycloalkyl or substituted cycloalkyl, or $R_{23}$ and $R_{24}$ taken together and with the nitrogen to which they are joined form a pyrrolidinium, piperazinium, morpholinium, aziridinium or piperidinium ring,

each of $R_{25}$ and $R_{26}$ is independently hydrogen, alkyl, substituted alkyl, cycloalkyl or substituted cycloalkyl,

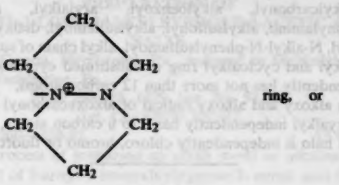
each of $R_{32}$, $R_{33}$, $R_{34}$ and $R_{36}$ is independently alkyl, substituted alkyl, carbocyclic aryl or substituted carbocyclic aryl,

$R_{35}$ is alkyl, substituted alkyl, cycloalkyl or substituted cycloalkyl, and

$R_{37}$ is amino, substituted amino, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, carbocyclic aryl or substituted carbocyclic aryl, or

$R_{23}$ and $R_{25}$ taken together and with the nitrogens to which they are joined form a pyrazolidinium, pyridazinium or pyrazolinium ring, or

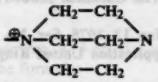
$R_{23}$, $R_{24}$, $R_{25}$ and $R_{26}$ taken together and with the nitrogens to which they are joined form a



ring, or

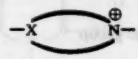
$R_{33}$ and $R_{34}$ taken together and with the nitrogen to which they are joined form a pyrrolidinium, piperidinium, morpholinium, aziridinium or piperazinium ring, or

$R_{33}$, $R_{34}$ and $R_{35}$ taken together and with the nitrogen to which they are joined are



or a pyridinium or quinolinium ring,

is a piperidinium, pyrrolidinium, morpholinium, aziridinium, piperazinium or pyrazolinium ring,



is a pyridinium, quinolinium, isoquinolinium, tetrahydroquinolinium, pyrazolium, triazolium, pyridazinium, imidazolium, pyrimidinium, thiazolium, benzothiazolium, thiadiazolium, indazolium, pyrrolium, indolium, oxazolium, isoxazolium or tetrazolium ring, and

X is a carbon or nitrogen atom,

wherein each hydrocarbyl is independently alkyl, cycloalkyl or carbocyclic aryl,

each substituent of substituted alkyl is independently halo, hydroxy, cyano or phenyl,

each substituent of substituted cycloalkyl is independently halo, hydroxy, cyano, phenyl or alkyl,

each substituent of substituted carbocyclic aryl and substituted heterocyclyl is independently halo, nitro, cyano, thiocyano, hydroxy, alkyl, alkoxy, trifluoroalkyl, trichloroalkyl, phenyl, phenoxy, amino, alkylamino, dialkylamino, anilino, alkylsulfonyl, carbocyclic arylsulfonyl, sulfamoyl, alkylsulfamoyl, dialkylsulfamoyl, carbocyclic arylsulfamoyl, phenylazo, diphenylazo or naphthylazo,

each substituent of substituted amino is independently alkyl, cycloalkyl, carbocyclic aryl or carbocyclic arylalkyl,

each carbocyclic aryl is independently phenyl, naphthyl or tetrahydronaphthyl,

each heterocyclyl is independently pyridyl, quinolyl, tetrahydroquinolyl, piperidyl, pyrrolidinyl, morpholinyl, aziridinyl, piperazinyl, isoquinolyl, pyrazolinyl, triazolyl, triazolonyl, pyridazinyl, imidazolyl, pyrimidinyl, thiazolyl, benzothiazolyl, indazolyl, pyrrolyl, indolyl, oxazolyl, isoxazolyl, pyrazolidinyl, trimethylenepyrazolidinyl, thienyl or tetrazolyl,

each alkyl, cycloalkyl, alkyl radical or each alkoxyalkyl,

trifluoroalkyl, trichloroalkyl, alkylamino, dialkylamino, alkylcarbonyl, alkylbenzoyl, arylalkyl, alkylcarbonylamino, alkylsulfonyl, alkylsulfamoyl, dialkylsulfamoyl, N-alkyl-N-phenylsulfamoyl, alkyl chain of substituted alkyl and cycloalkyl ring of substituted cycloalkyl independently has not more than 12 carbon atoms,

each alkoxy and alkoxy radical of alkoxycarbonyl and alkoxyalkyl independently has 1 to 6 carbon atoms, and

each halo is independently chloro, bromo or fluoro.

---

**4,213,899**

## REACTIVE DYESTUFFS CONTAINING CHLORINE OR FLUORINE SUBSTITUENTS AND ONE OR MORE PYRIDINE RADICALS LINKED TO THE DYESTUFF AT THE 2-, 4- OR 6-POSITION

**Duncan A. S. Phillips; Brian Anderson; Neville Jackson; Cecil V. Stead, and Alan T. Costello, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, United Kingdom**

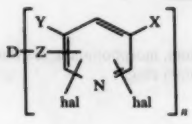
**Filed Mar. 13, 1978, Ser. No. 886,127**

**Claims priority, application United Kingdom, May 27, 1977, 22471/77**

**Int. Cl.[2] C09B** *62/36, 62/38, 62/40, 62/42*

**U.S. Cl. 260—156** **6 Claims**

1. A dyestuff which is capable of reacting with cellulose at 40° C. in the presence of an acid binding agent to yield a colored product with resistance to acid bleeding, said dyestuff having the formula



where

D is a chromophoric group

n is 1 or 2

z is

where R is H, $C_{1-4}$alkyl, $C_{1-4}$alkyl substituted by OH, $OSO_3H$, CN or $SO_3H$ or is phenyl

each hal independently represents a chlorine or fluorine atom occupying one of the remaining 2-, 4- and 6-positions of the pyridine nucleus

X is CN

Y is Cl.

---

**4,213,900**

## SPRAY-DRYING METHOD FOR THE PREPARATION OF WATER-DISPERSIBLE PULVERULENT DISPERSE DYE FORMULATIONS

**Ewald Daubach, Ludwigshafen; Dieter Horn; Erwin Hahn, both of Heidelberg, and Herbert Uhrig, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 17, 1978, Ser. No. 925,527**

**Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732500**

**Int. Cl.[2] C09B** *5/24, 6/00, 46/00*

**U.S. Cl. 260—208** **13 Claims**

1. A process for the preparation of a water-dispersible pulverulent formation of a disperse dye, which comprises preparing a solution which comprises:

(a) one or more disperse dyes,

(b) one or more water-soluble anionic dispersants,

(c) from 0 to 20% by weight, based on (a+b+c+d), of further surfactants and

(d) from 0 to 20% by weight, based on (a+b+c+d), of agents which serve as protective colloids, the sum (c+d) being not greater than 20% by weight, dissolved in

(e) formic acid, formamide, N-methylformamide, butyrolactone, ethylene glycol, propylene glycol or a mixture of these and

(f) from 0 to 100% by weight, based on (e), of N,N-dimethylformamide, acetic acid or a mixture of these; and spray-drying said solution.

---

**4,213,901**

## 1-AZA-1,5,9-CYCLODODECATRIENES

**Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

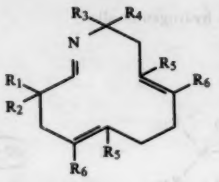
**Filed Jul. 10, 1978, Ser. No. 923,437**

**Claims priority, application Switzerland, Jul. 19, 1977, 8913/77**

**Int. Cl.[2] C07D** *225/02*

**U.S. Cl. 260—239 BE** **10 Claims**

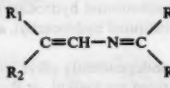
1. A compound of the formula I



(I)

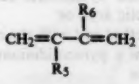
in which $R_1$ and $R_3$ independently of one another are hydrogen or alkyl having 1–8 C atoms and $R_2$ and $R_4$ independently of one another are alkyl having 1–8 C atoms, or $R_1$ and $R_2$ and/or $R_3$ and $R_4$ together with the bonding C atom form cycloalkyl having 5–8 C atoms, and $R_5$ and $R_6$ independently of one another are hydrogen or alkyl having 1–4 C atoms.

9. A process for the preparation of a compound of the formula I according to claim 1, which comprises reacting an aza-butadiene of the formula II



(II)

in which $R_1$ to $R_4$ are as defined in claim 1, in the presence of a catalyst which is a nickel-(O) complex of a diene of the formula III, obtained by the reduction of a carbonyl-free nickel compound in the presence of a diene of the formula III in the presence or absence of an electron donor ligand selected from the group consisting of alkyl phosphines, aryl phosphines, alkyl phosphites, aryl phosphites, alkyl argines, aryl arsines, alkyl antimonys and aryl antimonys, at a temperature between about −40° C. and 150° C. with a compound of the formula III



(III)

in which $R_5$ and $R_6$ are as defined in claim 1.

4,213,902

## PROCESS FOR PRODUCING STEROIDAL 7α-ACYLTHIO-4-EN-3-ONES

Hiromi Okushima, Kawasaki; Issei Nitta, Machida, and Rikizo Furuya, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 882,225, Feb. 28, 1978, abandoned. This application Jan. 31, 1979, Ser. No. 8,173
Claims priority, application Japan, Mar. 17, 1977, 52/29586
Int. Cl.² C07J 19/00
U.S. Cl. 260—239.57 12 Claims

1. In a process for producing a steroidal 7α-acylthio-4-en-3-one by the addition of a thiocarboxylic acid to a steroidal 4,6-dien-3-one, the improvement which comprises effecting the reaction in the presence of a strong acid in a neutral organic solvent.

---

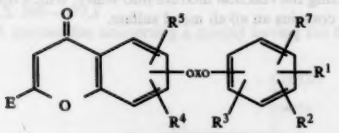
4,213,903

## BASIC AMINO ACID SALTS OF CHROMONES

John R. Bantick; David N. Hardern, and Thomas B. Lee, all of Loughborough, England, assignors to Fisons Limited, London, England

Filed Jan. 16, 1978, Ser. No. 869,653
Claims priority, application United Kingdom, Jan. 26, 1977, 3061/77
Int. Cl.² C07D 257/04, 311/22
U.S. Cl. 548—250 5 Claims

1. A salt with a basic amino acid selected from the group consisting of lysine, arginine, ornithine, and the N-methyl derivatives of lysine, arginine, and ornithine, of a compound of the formula:




wherein $R^1$, $R^2$, $R^3$, $R^4$, $R^5$ and $R^7$ each represent a group selected from hydrogen, hydroxy, C1 to 6 alkoxy, C1 to 6 alkoxy substituted by phenyl, C2 to 6 alkanoyl, C3 to 6 alkenoyl, amino, C2 to 6 alkanoylamino, C2 to 6 alkenyl, halogen and C1 to 6 alkyl, at least one of $R^1$, $R^2$, $R^3$ and $R^7$ representing a group other than hydrogen and hydroxy,

or an adjacent pair of $R^1$, $R^2$, $R^3$ and $R^7$ either represent hydroxy and a 3-(N,N-dialkylamino)acryloyl radical or together represent a chain —COCH=CH—O—,

X represents an alkylene chain of 2 to 10 carbon atoms optionally substituted by a hydroxy group, and

E represents a carboxy or tetrazole group.

---

4,213,904

## FLUORESCENT LABELING REAGENTS CONTAINING THE FLUORESCEIN AND EOSIN CHROMOPHORES

Richard P. Haugland, 1008 Orlando Cir., Plano, Tex. 75070

Filed Feb. 28, 1979, Ser. No. 16,084
Int. Cl.² C07D 405/08
U.S. Cl. 260—326.5 CA 1 Claim

1. Fluorescent labels for biomolecules comprising the fluorescein or eosin chromophores covalently attached at the 5 or 6 position to the nitrogen of a maleimide group.

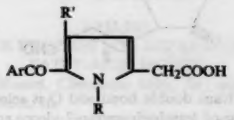
4,213,905

## PREPARATION OF 5-AROYL-1-LOWERALKYLPYRROLE-2-ACETIC ACID SALTS

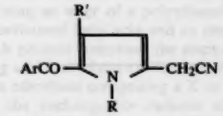
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Jun. 25, 1979, Ser. No. 51,646
Int. Cl.² C07D 207/32
U.S. Cl. 260—326.47 15 Claims

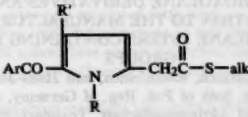
1. A process of preparing an alkali metal or alkaline earth metal salt of 5-aroyl-1-loweralkylpyrrole-2- acetic acid having the formula:




which comprises reacting a 5-aroyl-1-loweralkylpyrrole-2-acetonitrile having the formula:




with an alkyl mercaptan in the presence of mineral acid in an anhydrous aprotic organic solvent under an inert atmosphere at or below 10° C. to yield a thiol ester having the formula:




and then hydrolyzing said thiol ester by treatment with an aqueous solution of an alkali metal or alkaline earth metal hydroxide, wherein the above formulas, R is loweralkyl, R' is a member selected from the group consisting of hydrogen and loweralkyl, and Ar is a member selected from the group consisting of phenyl and phenyl substituted with from one to three substituents each selected from the group consisting of loweralkyl, loweralkoxy and halo.

---

4,213,906

## HYDROGEN PEROXIDE OXIDATION PROCESS FOR KETONES

Frank Mares, Whippany, and Stephen E. Jacobson, Succasunna, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 21, 1978, Ser. No. 926,778
Int. Cl.² C07D 313/04
U.S. Cl. 260—343 3 Claims

1. In a method for oxidizing a solution of cyclic ketone to obtain lactone with hydrogen peroxide in the presence of a catalyst comprising a member of the group consisting of arsenic as such or as an arsenic compound, the improvement which comprises addition to the solution of between about 0.5 to 3 equivalents of a buffering agent with respect to the equivalents of arsenic derivative employed, said buffering agent comprising salts of weak acids and bases or bases which form soluble salts with arsenic derivatives themselves, thereby suppressing the hydrolysis of the oxidation products.

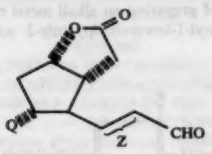
4,213,907

## PROSTAGLANDIN INTERMEDIATES

Jasjit S. Bindra, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,270
Int. Cl.[2] C07D 307/77
U.S. Cl. 260—343.3 P 2 Claims

1. A compound of the formula



wherein Z is a trans double bond and Q is selected from the group consisting of tetrahydropyran-2-yloxy and dimethyl-t-butylsilyloxy.

---

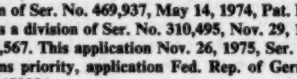
4,213,908

## SILICEOUS DIOXOLANE DERIVATIVES AND THEIR APPLICATION TO THE MANUFACTURE OF ORGANOSILANE ESTERS CONTAINING EPOXY GROUPS

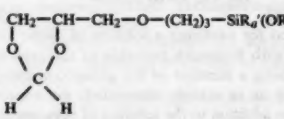
Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 469,937, May 14, 1974, Pat. No. 3,932,462, which is a division of Ser. No. 310,495, Nov. 29, 1972, Pat. No. 3,825,567. This application Nov. 26, 1975, Ser. No. 635,533
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1971, 2159991
Int. Cl.[2] C07F 7/08, 7/18
U.S. Cl. 260—348.16 6 Claims

1. Process of producing 3-glycidyloxypropylalkoxysilanes of the formula:



wherein a is 0 or 1 and R' and R'' each represent an alkyl radical wherein the R'' 's can be the same or different, which comprises heating a siliceous dioxolane of the formula:



wherein a, R' and R'' are as defined for the 3 glycidyl derivative, at a temperature of about 130°–240° C. and pressure and for a time sufficient to split off formaldehyde from said siliceous dioxolane to form said glycidyl derivative.

4,213,909

## PROCESS FOR THE PREPARATION OF 1-AMINO-4-BROMOANTHRAQUINONE-2-SULFONIC ACID II

Gerhard Berg; Walter Hohmann, both of Leverkusen; Karl-Julius Reubke, Cologne, and Klaus Wunderlich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,714
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740889
The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.
Int. Cl.[2] C07C 143/63
U.S. Cl. 260—371 14 Claims

1. A process for preparing 1-amino-4-bromoanthraquinone-2-sulfonic acid or an alkali metal salt thereof which comprises:

(a) converting 1-nitroanthraquinone to 1-aminoanthraquinone by:

(1) contacting said 1-nitroanthrquinone with sodium sulfide and/or sodium bisulfide under reducing conditions; or

(2) contacting said 1-nitroanthraquinone with ammonia under conditions whereby the nitro group is replaced by an amino group;

(b) treating the product from step (a) with oleum at a temperature in the range from 90° to 150° C. optionally in the presence of an alkali metal sulfate and brominating the resultant sulfonated product with bromine at a temperature in the range from 60° to 100° C.; and

(c) thereafter recovering 1-amino-4-bromanthraquinone-2-sulfonic acid or an alkali metal salt thereof by a process comprising:

(1) adjusting the sulfuric acid concentration of the reaction mixture to a sulfuric acid content of 60 to 85 percent by weight; or

(2) stirring the reaction mixture into water, which optionally contains an alkali metal sulfate.

---

4,213,910

## PROCESS FOR THE PREPARATION OF 1-AMINO-4-BROMOANTHRAQUINONE-2-SULPHONIC ACID I

Rolf Muders, Cologne; Heinrich Leister; Helmut Dittmer, both of Leverkusen, and Hubert Schönhagen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,715
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740885
The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.
Int. Cl.[2] C07C 143/63
U.S. Cl. 260—371 11 Claims

1. A process for preparing 1-amino-4-bromoanthraquinone-2-sulphonic acid or an alkali metal salt thereof which comprises contacting 1-amino-anthraquinone at a temperature in the range of 90° to 150° C. with an $SO_3$-containing sulphuric acid (oleum) and thereafter treating the resultant sulphonated 1-amino-anthraquinone with at least 0.5 molar equivalent of bromine, relative to 1 mol of 1-amino-anthraquinone, at temperatures in the range from 60° to 100° C.

## 4,213,911
## PROCESS FOR PREPARING HIGH-MELTING CHENODEOXYCHOLIC ACID

Michael C. Attwell, Islington; Thomas F. Massiah, Agincourt; Roberto A. Vergottini, Rexdale, and Peter Ziegler, Toronto, all of Canada, assignors to Canada Packers Limited, Canada

Filed Nov. 7, 1978, Ser. No. 958,508
Int. Cl.[2] C07J 9/00
U.S. Cl. 260—397.1 12 Claims

1. A process for preparing a high-melting form of chenodeoxycholic acid having a melting point of at least about 160° C. which comprises the steps of:

(a) suspending at least one form of chenodeoxycholic acid having a melting point of below 160° C. in a non-aromatic, liquid hydrocarbon having a boiling point of between about 65° and 140° C. to form a suspension having a boiling point of at least 65° C.;

(b) heating the suspension to a sufficiently high temperature of between about 65° and about 140° C. during a sufficiently long period of time for converting substantially all of the chenodeoxycholic acid into the high-melting form; and

(c) removing the high-melting form of chenodeoxycholic acid from the suspension.

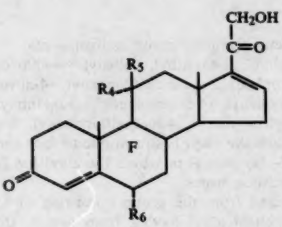
---

## 4,213,912
## PROCESS FOR PREPARING STEROIDAL [16α,17-D]CYCLOHEXENE-21-CARBOXYLIC ACID ESTERS

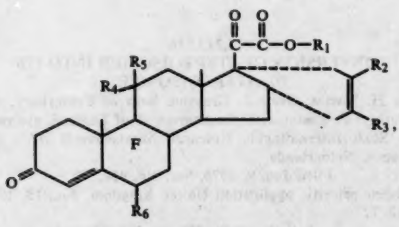
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 26, 1979, Ser. No. 33,351
Int. Cl.[2] C07J 5/00
U.S. Cl. 260—397.1 1 Claim

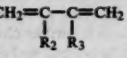
1. A process for converting a steroid having the formula



or the 1,2-dehydro derivative thereof, to a steroid having the formula



or the 1,2-dehydro derivative thereof, which comprises first converting the 21-hydroxy group of the starting steroid to a 21-carboxylic acid ester group and reacting the latter with a butadiene having the formula



under Diels-Alder wherein

$R_1$ is alkyl of 1 to 10 carbon atoms, aryl, or arylalkyl;

$R_2$ and $R_3$ are the same or different and are hydrogen, alkyl or aryl;

$R_4$ is hydrogen and $R_5$ is hydroxy or together $R_4$ and $R_5$ are $=O$; and

$R_6$ is hydrogen, methyl or fluorine.

---

## 4,213,913
## TWO-STAGE PROCESS FOR SEPARATING MIXED FATTY-ACID ESTERS

Armand J. de Rosset, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 12, 1979, Ser. No. 19,966
Int. Cl.[2] C09F 5/10; C11B 3/00
U.S. Cl. 260—428.5 14 Claims

1. A process for separating an ester of a polyethanoid fatty acid and an ester of a monoethanoid fatty acid from a first mixture comprising an ester of a polyethanoid fatty acid, an ester of a monoethanoid fatty acid and an ester of a saturated fatty acid which process comprises the steps of:

(a) contacting said first mixture at first adsorption conditions with a first adsorbent comprising a X or a Y zeolite containing at the exchangeable cationic sites at least one cation selected from the group consisting of cations of metals of Group IA of the Periodic Table of Elements and combinations thereof thereby selectively adsorbing said ester of a polyethanoid fatty acid;

(b) removing from said first adsorbent a first raffinate output stream comprising said ester of a monoethanoid fatty acid and said ester of a saturated fatty acid;

(c) contacting said first adsorbent at first desorption conditions with a desorbent material to effect the desorption of said ester of a polyethanoid fatty acid from said first adsorbent;

(d) removing from said first adsorbent a first extract output stream comprising said ester of a polyethanoid fatty acid;

(e) contacting a second mixture comprising said first raffinate output stream at second adsorption conditions with a second adsorbent comprising a X or a Y zeolite containing at exchangeable cationic sites cations selected from the group consisting of pi-bonding metals and one or more second cations selected from the group consisting of sodium, potassium, rubidium and cesium, thereby selectively adsorbing said ester of a monoethanoid fatty acid;

(f) removing from said second adsorbent a second raffinate output stream comprising said ester of a saturated fatty acid;

(g) contacting said second adsorbent at second desorption conditions with a desorbent material having the same composition as the desorbent material used in step (c) above to effect the desorption of said ester of a monoethanoid fatty acid from said second adsorbent;

(h) removing from said second adsorbent a second extract output stream comprising said ester of a monoethanoid fatty acid;

(i) passing said first extract output stream and said second extract output stream to a single desorbent recovery means and therein fractionating said output streams in admixture to separate substantially all of said desorbent material from the extracted esters of polyethanoid and monoethanoid fatty acids contained in the admixed output streams;

(j) supplying separate portions of the desorbent material from step (i) to said first and second adsorbents in steps (c) and (g), respectively, to remove adsorbed esters therefrom; and

(k) recovering from said desorbent recovery means an ex-

tract product stream comprising substantially all of said esters of a polyethanoid fatty acid and monoethanoid fatty acid contained in said first mixture.

2. The process of claim 1 further characterized in that said ester of a polyethanoid fatty acid, said ester of a monoethanoid fatty acid and said ester of a saturated fatty acid each contain from about 8 to about 30 carbon atoms per molecule.

---

## 4,213,914
## ETHYLENIC SILICON COMPOUNDS AND THERMOPLASTIC ELASTOMERS OBTAINED THEREFROM

**Michel Bargain, Lyons, and Marcel Lefort, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

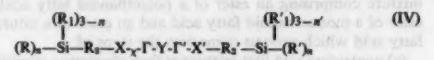
**Division of Ser. No. 851,898, Nov. 16, 1977, Pat. No. 4,147,711, which is a division of Ser. No. 617,513, Sep. 29, 1975, Pat. No. 4,088,670. This application Dec. 1, 1978, Ser. No. 965,529**

**Claims priority, application France, Oct. 1, 1974, 74 33041; Feb. 11, 1975, 75 04191; Feb. 11, 1975, 75 04192**

**Int. Cl.² C07F 7/10**

**U.S. Cl. 556—419** **41 Claims**

1. A polyethylenic silicon compound having the general formula:



(IV)

in which

each of n and n', which may be identical or different, is 1, 2 or 3;

each of R and R', which may be identical or different, is a monovalent organic group containing an ethylenic double bond and from 2 to 10 carbon atoms;

each of $R_1$ and $R_1'$, which may be identical or different, is a straight or branched alkyl radical optionally substituted by one or more halogen atoms or cyano groups, or an aryl or alkylarly radical, optionally substituted by one or more halogen atoms;

each of $R_2$ and $R_2'$, which may be identical or different, is a straight or branched alkylene or alkylidene radical having from 1 to 4 carbon atoms;

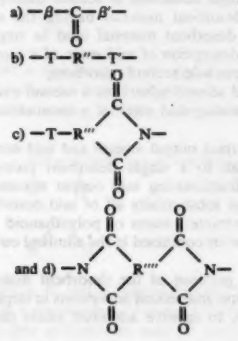
each of X and X', which may be identical or different, is a divalent radical consisting of, or containing, at least one O, S or N atom, the radicals X and X' being linked to the radicals $R_2$ and $R'_2$ via the hetero-atom;

each of Γ and Γ', which may be ientical or different, is an oganic radical having from 1 to 30 carbon atoms, selected from

(a) a divalent radical —G— and —G'— and

(b) a trivalent radical $—G_1<$ and $—G'_1<$;

Ψ is an organic radical selected from:



a) (V)

b) (VI)

(VII)

c)

(VIII)

and d)

in which

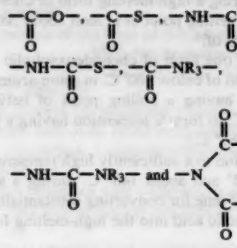
each of β and β' independently represents an oxygen or nitrogen atom;

R'' represents a valency bond or a divalent organic radical;

R''' represents a trivalent organic radical;

R'''' represents a tetravalent organic radical and

each of T and T', which may be identical or different, represents a functional group selected from



wherein $R_3$ represents a hydrogen atom or an alkyl radical having from 1 to 6 carbon atoms.

---

## 4,213,915
## N-HALO-ALKYL THIOLCARBAMATES AND N-ALKENYL THIOLCARBAMATES

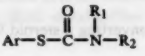
**Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 30, 1976, Ser. No. 701,384**

**Int. Cl.² C07C 155/08; A01N 9/12**

**U.S. Cl. 260—455 A** **14 Claims**

1. A compound represented by the general formula



wherein:

Ar is selected from the group consisting of:

α-naphthyl, β-naphthyl, phenyl, 4-chlorophenyl, 2-chlorophenyl, 3,4-dichlorophenyl, 4-nitrophenyl, 4-fluorophenyl, 4-bromophenyl, 3-methoxyphenyl, 3-methylthiophenyl, 4-methylthiophenyl, 4-alkylphenyl in which the alkyl has from one to four carbon atoms, and 3-alkylphenyl in which the alkyl has from one to four carbon atoms;

$R_1$ is selected from the group consisting of hydrogen, a straight chain alkyl having from one to three carbon atoms, a halo-alkyl having from three to four carbon atoms, said halo being chloro or bromo; and

$R_2$ is a halo-alkyl having from three to four carbon atoms, said halo being chloro or bromo.

---

## 4,213,916
## CONVERSION OF STEREOISOMER INTO ITS DIASTEREOISOMER

**John H. Davies; Basil T. Grayson, both of Canterbury, and Herbert P. Rosinger, Sittingbourne, all of England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands**

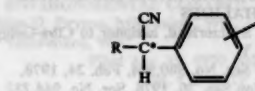
**Filed Jun. 9, 1978, Ser. No. 914,571**

**Claims priority, application United Kingdom, Jun. 13, 1977, 24612/77**

**Int. Cl.² C07C 121/66, 121/75**

**U.S. Cl. 260—465 D** **7 Claims**

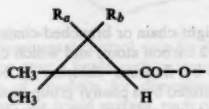
1. A process for the conversion of a stereoisomer into its diastereoisomer of a compound having the following general formula:



(I)

wherein the asterisk denotes an asymmetric carbon atom; n is 1 to 5; each X is independently a hydrogen, chlorine, fluorine or bromine atom, an alkyl or alkoxy group of 1 to 4 carbon atoms, a phenyl or phenoxy group, a phenylalkyl or alklphenyl group of up to 10 carbon atoms, or a nitro, hydroxy or cyano group; R is an organic residue containing one or more centres of asymmetry and is selected from:

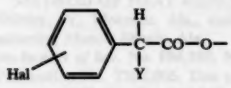
(a) a cyclopropane carboxylic acid residue having the following general formula:



(II)

wherein $R_a$ and $R_b$ both represent an alkyl group having from 1 to 6 carbon atoms; or $R_a$ and $R_b$ together represent an alkylene group having from 2 to 6 carbon atoms; or $R_a$ represents a hydrogen atom and $R_b$ represents an alkenyl group having from 2 to 6 carbon atoms and from 1 to 3 fluorine, chlorine or bromine atoms; with the provision that when one of $R_a$ and $R_b$ represent a methyl group the other does not, and

(b) a phenyl acetic acid residue having the following general formula:



(III)

wherein Hal represents a halogen atom, and Y represents an alkyl group of 1 to 6 carbon atoms;

which process comprises subjecting the said stereoisomer to the action of an alkali metal carbonate and an inert polar solvent at a temperature in the range 20° to 100° C. to effect conversion of configuration at the carbon atom denoted by the asterisk without interfering with one or more centres of asymmetry in R, and physically separating the required diastereoisomer from the resulting mixture of diastereoisomers.

---

**4,213,917**

## ESTERIFICATION OF AROMATIC ALDEHYDES

**Serge R. Dolhyj, Parma; Dev D. Suresh, Macedonia, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio**

**Filed Dec. 1, 1978, Ser. No. 965,653**
**Int. Cl.² C07C *67/44***
**U.S. Cl. 260—465 D** **32 Claims**

1. A process for producing an aromatic ester by the oxidation of an aromatic aldehyde in which the aromatic aldehyde, an alcohol and molecular oxygen are contacted with a catalyst of the formula:

$$Mo_aX_bY_cO_x$$

wherein

X is one or more elements selected from the group consisting of V, W, Sn, Cu, Sb and P; and

Y is one or more elements selected from the group consisting of Li, Na, K, Rb, Cs, Mg, Ca, Sr, Ba, As, Bi, La, Ce, rare earths, Nb, Ta, Cr, U, Fe, Co, Ni, Zn, Cd, Ag and Tl; and

wherein

a is 0.1–20;

b is 0–4;

c is 0–2;

b+c>0; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

---

**4,213,918**

## PROCESS FOR PRODUCING CLEAR AQUEOUS SOLUTION OF OLEFIN SULFONIC ACID

**Akira Hayashi, Sakura; Haruo Ohkouchi; Kyozo Kitano, both of Chiba, and Toshiaki Ogoshi, Funabashi, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan**

**Filed Mar. 14, 1979, Ser. No. 20,336**
**Claims priority, application Japan, Mar. 20, 1978, 53-30979**
**Int. Cl.² C07C *143/02***
**U.S. Cl. 260—513 T** **7 Claims**

1. A process for producing a clear aqueous solution of the magnesium salt of an olefin sulfonic acid comprising the steps of:

(a) sulfonating at least one olefin having 8 to 22 carbon atoms by a gaseous sulfur trioxide diluted with an inert gas;

(b) neutralizing at least a portion of the sulfonic acid contained in the resulting sulfonated olefin by mixing said sulfonated olefin with (i) an aqueous inorganic alkali dispersion containing magnesium hydroxide, magnesium oxide or a mixture thereof and (ii) at least one water-soluble alkanol amine, in such amounts that the total amount of said inorganic alkali and said alkanol amine is within the range of from 1.0 to 1.1 chemical equivalent based on 1.0 chemical equivalent of the sulfonated olefin and that the amount of the inorganic alkali is within the range of from 0.75 to 0.95 chemical equivalent based on 1.0 chemical equivalent of the sulfonated olefin, and;

(c) heating the resulting neutralization mixture at a pH of from 6.0 to 8.0 to thereby hydrolyze the mixture.

---

**4,213,919**

## MANUFACTURE OF β-CHLOROCARBOXYLIC ACID CHLORIDES

**Joachim Datow; Martin Decker; Karl Merkel, all of Ludwigshafen, and Franz Neumayr, Weisenheim am Berg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 755,855, Dec. 30, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 959,834**
**Int. Cl.² C07C *51/58***
**U.S. Cl. 260—544 K** **4 Claims**

1. A process for the manufacture of a β-chlorocarboxylic acid chloride by the catalytic reaction of phosgene and an α,β-unsaturated carboxylic acid which comprises:

(a) in a first stage, reacting from about 5 to 40 mole % of the α,β-unsaturated carboxylic acid with hydrogen chloride in the absence of added solvents, and

(b) in a second stage, reacting the first stage reaction mixture with phosgene in the presence of an effective amount of a catalyst.

---

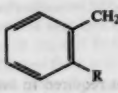
**4,213,920**

## PROCESS FOR THE PRODUCTION OF SUBSTITUTED BENZALDEHYDES

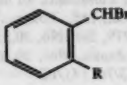
**Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jun. 28, 1978, Ser. No. 920,102**
**Claims priority, application Switzerland, Jul. 6, 1977, 8338/77**
**Int. Cl.² C07C *45/00***
**U.S. Cl. 568—424** **6 Claims**

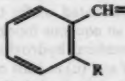
1. A process for the production of benzaldehydes which are substituted in the ortho-position by an electrophilic group R, which comprises brominating an ortho-substituted compound of the formula I with elementary bromine


(I)

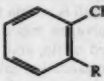
in which R represents the nitro group, the cyano group, an alkoxy group of1 to 8 carbon atoms or a halogen atom, under irradiation with visible light in an inert halogenated hydrocarbon solvent, at a temperature between 30° and 90° C. to give the bromide of the formula II


(II)

converting the resulting bromide at a temperature between 60° and 120° C. by treatment with an alkali bromide in an inert solvent other than that used above, into a styrene compound of the formula III


(III)

and ozonising this latter compound in an inert solvent to give the compound of the formula IV


(IV)

---

**4,213,921**

## OLEFIN HYDROFORMYLATION

**Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 753,749, Dec. 23, 1976, abandoned, which is a division of Ser. No. 681,883, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 443,557, Feb. 19, 1974, Pat. No. 3,980,583. This application Nov. 22, 1976, Ser. No. 962,941**

**Int. Cl.[2] C07C *45/10***

**U.S. Cl. 568—455** **17 Claims**

1. In the method for hydroformylation of an olefin to produce aldehydes and alcohols, said process comprising reacting a mixture of said olefin with carbon monoxide and hydrogen under conversion conditions including a temperature of between about 25° C. and about 300° C., a pressure of between about atmospheric and about 150 atmospheres, a contact time of between about 5 minutes and about 2 hours, a hydrogen/carbon monoxide ratio of between about 0.3 and about 3, and a hydrogen/olefin ratio between about 0.5 scf/bbl and about 10 scf/bbl, said reacting being conducted by contacting said mixture with a hydroformylation catalyst, the improvement which comprises utilizing as said hydroformylation catalyst a catalytic material which comprises a substrate of a porous refractory oxide, said substrate having surface hydroxyl groups, a minimum surface area of about 10 $m^2/g$ and pores with a minimum pore diameter of about 5 Angstrom Units, and substrate being modified by at least one amine functional member, containing the element silicon, coordinated to a metal function of a transition metal selected from the group consisting of nickel, cobalt and rhodium, said amine functional member acting as a bridging member between said substrate and said metal function, as a ligand covalently bonded to said substrate.

**4,213,922**

## PROCESS FOR PRODUCING PHOSPHONIC ACID HALIDES

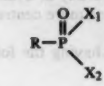
**Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 880,904, Feb. 24, 1978, abandoned. This application Sep. 20, 1978, Ser. No. 944,232**

**Int. Cl.[2] C07F *9/146, 9/38***

**U.S. Cl. 260—958** **8 Claims**

1. A process for producing phosphonic acid halides of the formula


(I)

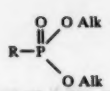
in which

R represents a straight-chain or branched-chain alkyl group which has 1 to 12 carbon atoms and which can be mono- to trisubstituted by fluorine, chlorine or bromine, and mono- or disubstituted by a phenyl group unsubstituted or substituted by fluorine, chlorine or bromine or by an alkyl group having 1 to 12 carbon atoms, or represents a cycloalkyl group which has 4 to 6 ring carbon atoms and which can be substituted by alkyl having 1 to 5 carbon atoms, or bound by an alkylene group having 1 to 4 carbon atoms, or R represents a phenyl group which is unsubstituted or substituted by fluorine, chlorine or bromine or by alkyl having 1 to 5 carbon atoms,

$X_1$ represents chlorine or bromine, and

$X_2$ represents an alkoxy group having 1 to 12 carbon atoms, chlorine or bromine,

which process comprises reacting a dialkylphosphonate of the formula II


(II)

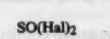
wherein R has the meaning given under the formula I, and "Alk" represents an alkyl group having 1 to 12 carbon atoms, at 70° to 150° C., in the presence of 0.005 to 0.05 mol, per mol of dialkylphosphonate of the formula II, of a nitrogen compound selected from the group consisting of

(1) N,N-disubstituted formamides which are substituted on the nitrogen atom by lower alkyl groups or by a lower alkyl group and a phenyl group or by two phenyl groups, with two alkyl groups being able to form a polymethylene group which can be interrupted by an oxygen atom and which forms with the adjacent nitrogen atom a heterocyclic ring;

(2) tertiary amines selected from the group consisting of trialkylamines, N,N-dialkyl-arylamines, pyridine and N',N'-dialkylaminopyridine, with in each case two alkyl groups being able to form a polymethylene group which can be interrupted by an oxygen atom and which forms with the nitrogen atom a heterocyclic ring; and

(3) N,N-disubstituted phosphoric acid triamides selected from the group consisting of hexa-alkylphosphoric acid triamides, with in each case the two alkyl groups bound to a nitrogen atom being able to form a polymethylene group which can be interrupted by an oxygen atom and which forms with the nitrogen atom a heterocyclic ring;

with at least the equivalent amount of a thionyl halide of the formula III


(III)

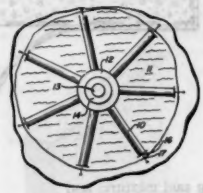
in which "Hal" represents chlorine or bromine.

4,213,923

## ENVIRONMENTAL CONTROL UNIT AND METHOD

John D. Bryson, Milwaukee, Wis., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed Apr. 19, 1979, Ser. No. 31,662
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—120 7 Claims



1. An environmental control unit for dispensing odor neutralizing vapor over a liquid surface comprising:

a plurality of conduits for dispensing odor neutralizing vapor over the liquid surface, each of said conduits being partially submerged and sufficiently buoyant to be supported on the surface of the liquid at least partially by buoyant forces exerted by the liquid and having vapor dispensing outlets thereon located above the surface of the liquid and directing the vapor downwardly over the liquid surface; and

a central source of the vapor in fluid communication with said conduits.

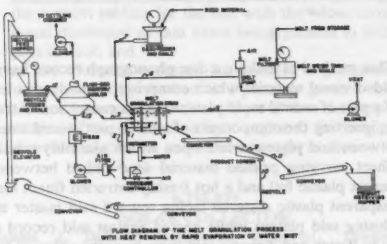
---

4,213,924

## GRANULATION AND COATING BY IMPROVED METHOD OF HEAT REMOVAL

Arthur R. Shirley, Jr., Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 850,588, Nov. 11, 1977, now Defensive Publication No. T980,005. This application Jun. 19, 1978, Ser. No. 916,988
Int. Cl.[2] B01J 2/12
U.S. Cl. 264—7 7 Claims



FLOW DIAGRAM OF THE MELT GRANULATION PROCESS WITH HEAT REMOVAL BY RAPID EVAPORATION OF WATER MIST

1. In an improved process for the granulation of materials wherein same is effected in an enclosed vessel by spraying particles of molten material on rapidly moving granules of substrate such that the granules of substrate are increased in size by accretion as the sprayed particles solidify quickly on the surface of said substrate, and wherein at least a substantial amount of the heat of crystallization and associated heat from cooling the molten material and subsequently solid material is removed by evaporation of water in said enclosed vessel into air being moved through said enclosed vessel, the improvement in combination therewith which comprises the additional steps of:

(1) atomizing the water to be evaporated in said enclosed vessel into finely divided droplets having a median volume diameter of less than $1.967\times10^{-4}$ ft;

(2) spraying said water droplets with a spray angle, the arc of which is at least 30 degrees;

(3) spraying said water droplets in such a manner that the liquid water comprising same totally evaporates while in said air in a period of time of less than 2 seconds and from a predetermined juxtaposed position such that no water in the liquid phase contacts either the sprayed particles of molten material or of the substrate granules which are increasing in size by accretion from the solidification of said sprayed particles of molten material, or both;

(4) controlling the moisture content of said air below the dew point of said air everywhere in said enclosed vessel, below the concentration in said air where condensation would take place on any surface inside said enclosed vessel, and below the concentration in said air where granules of substrate of any size or at any point in said enclosed vessel would absorb water from said air, thus preventing water absorption by said granules of substrate and condensation of water in the air onto the inner surfaces of said enclosed vessel; and

(5) removing said heat of crystallization and associated heat from cooling the molten material and subsequently solid material by evaporation of said finely divided droplets of water to give an overall heat transfer rate which is represented in Btu/hr by either the numerator or denominator of the following equation which represents the thermodynamics of the instant process, i.e.

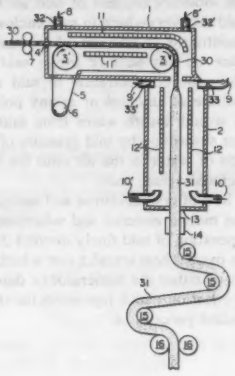
$$\frac{4\pi\bar{r}n(t_a - t_w)(k_f + k_c) + W_a\Delta H_a + W_v\Delta H_v}{h_g N_g A_g (t_g - t_a) + q_l} = 1$$

where $\pi$ is the ratio of the circumference of a circle to its diameter and is 3.1416 and dimensionless; r is the average radius in ft. of an evaporating droplet over its life span and is a maximum of $6.56\times10^{-5}$ ft; n is the number of water droplets present in atomized form in the vessel at a given instant and as such is dimensionless; $t_a$ is the average dry bulb temperature of the air in °F.; $t_w$ is the average wet bulb temperature of the air in °F.; $t_g$ is the average temperature of granules in contact with the air in °F.; $k_f$ is the thermal conductivity of the air in Btu-ft/(hr)(ft²)(°F.); $k_c$ is the forced thermal convection of air in contact with water droplets in Btu-ft/(hr)(ft²)(°F.); $W_a$ is the mass flow rate of air through the vessel less water evaporated in the vessel in lb/hr; $\Delta H_a$ is the difference in enthalpy of the air entering and leaving the vessel less water evaporated in the vessel in Btu/lb; $W_v$ is the mass flow rate of water sprayed and evaporated in the vessel in lb/hr; $\Delta H_v$ is the average change in enthalpy of the water evaporated in the vessel after it is in the vapor phase in Btu/lb; $h_g$ is the average heat transfer coefficient between granules and air in Btu/(ft²)(hr)(°F.); $N_g$ is the number of granules exposed to the air at any one instant and is dimensionless; $A_g$ is the average surface area of each one of those granules exposed to the air in square feet; and $q_l$ is the rate of heat flow from granules to the air by indirect means in Btu/hr, and where the lefthand term of the numerator fully describes the rate of heat transfer by evaporation of water in Btu/hr, and the middle and righthand terms of the numerator fully describe the heat absorbed by the air and the water vapor, respectively, in Btu/hr, and the denominator fully describes the rate of heat transfer from granules to air in Btu/hr.

## 4,213,925
## PROCESS FOR CONTINUOUSLY PRODUCING FOAMED SHEETS

Hiroshi Kiyono, Ohtsu; Akio Ishimoto, Kashihara; Yoichiro Noda, Saitama, and Kozo Yada, Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 785,293, Apr. 6, 1977, Pat. No. 4,124,344.
This application Aug. 14, 1978, Ser. No. 933,575
Claims priority, application Japan, Apr. 9, 1976, 51-40624
Int. Cl.[2] B29D 27/00
U.S. Cl. 264—22 21 Claims



1. A process for continuously producing a foamed sheet from a thermoplastic resin sheet containing a heat-decomposable blowing agent, said process comprising:

providing a thermoplastic resin sheet containing a heat-decomposable blowing agent;

supplying said sheet onto a conveyor and conveying said sheet horizontally by means of said conveyor;

supplying heat to said sheet, both from above and below said sheet, while said sheet is conveyed horizontally, and thereby heating said sheet to a temperature below the decomposition temperature of said blowing agent;

discharging said sheet from said conveyor and suspending the thus discharged sheet vertically;

heating the thus vertically suspended sheet to a temperature above said decomposition temperature, and thereby foaming said sheet; and

extending the thus foamed sheet by a sheet extending device.

---

## 4,213,926
## METHOD FOR MAKING A DECORATIVE PLATE USED IN A BUILDING

Minoru Toyoda, Kodaira; Tohei Horishima, Koganei; Kenji Sugimoto, Tokyo, and Kensuke Aoyama, Sakato, all of Japan, assignors to Taisei Kensetsu Kabushiki Kaisha and Dai Nippon Printing Co., Ltd., both of Tokyo, Japan

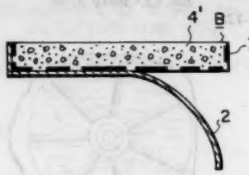
Continuation of Ser. No. 783,333, Mar. 31, 1977, abandoned.
This application Jul. 28, 1978, Ser. No. 928,919
Int. Cl.[2] B28B 7/36
U.S. Cl. 264—74 11 Claims

1. A process for making a decorative plate used in a building consisting essentially of the steps of:

(a) Preparing a transfer sheet by applying a primer layer comprising a water-soluble binder in an amount of 1 to 10 grams/m$^2$ (dry) on the surface of a synthetic resin sheet less than 0.5 mm thick and printing a pattern layer comprising a coloring agent and a binder at least one of which is water-soluble, on said primer layer;

(b) Making a mold for a slip casting wherein the pattern layer is on the inside surface of said mold by shaping the transfer sheet such that the surface of said pattern layer faces upward;

(c) Pouring a mixture comprising a hydraulic material and water into the mold for slip casting;



(d) Hardening said mixture; and

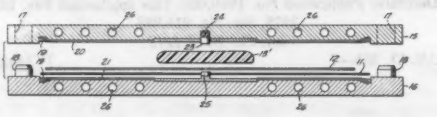
(e) Stripping said synthetic resin sheet from the resulting hardened configuration to produce said decorative plate.

---

## 4,213,927
## METHOD OF MAKING PICTURE PHONOGRAPH RECORD

John D. Alberti, 1528 Turnbull Canyon Rd., Hacienda Heights, Calif. 91745

Division of Ser. No. 945,305, Sep. 25, 1978, which is a continuation-in-part of Ser. No. 836,500, Sep. 26, 1977, abandoned. This application Jun. 29, 1979, Ser. No. 53,341
Int. Cl.[2] B29D 17/00
U.S. Cl. 264—107 10 Claims



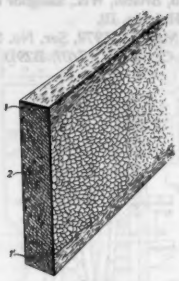
1. That method of making a disc phonograph record having embedded visual material which comprises: providing at least one of a pair of record mold platens with a master sound track matrix; inserting the components of a three-part record assembly between said platens while open which assembly consists of a sheet carrying printed material sandwiched between a transparent plastic foil and a hot freshly extruded fluent lump of transparent plastic material facing toward said master matrix; closing said platens while heated against said record assembly to flatten and disperse said lump over the adjacent face of said sheet and to fuse the periphery thereof to the periphery of said foil; and cooling said platens and removing the record therefrom.

10. A method of pressing records carrying embedded visual material which comprises: providing upper and lower mold platens with a respective sound track matrix; inserting a flexible transparent plastic foil onto one mold platen; providing the other mold platen centrally thereof with a lump of preheated fluent transparent plastic, and heating and closing said mold platens with a core sheet imprinted with indicia sandwiched between and in contact with said foil and said lump of plastic thereby to disperse said lump to form a relatively thick rigid layer impressed with a sound record with the face of said core sheet inseparably adherent to a respective one of said transparent plastic layers and visible therethrough.

## 4,213,928
## METHOD OF MAKING STRUCTURAL CHIPBOARD WOOD BEAM

Sven G. Casselbrant, Lidingö, Sweden, assignor to Kockums Industri AB, Söderhamn, Sweden

Division of Ser. No. 455,146, Mar. 27, 1974, Pat. No. 4,112,162. This application Jun. 19, 1978, Ser. No. 916,813
Int. Cl.[2] B29J 5/04; B32B 5/12
U.S. Cl. 264—113 4 Claims



1. A method of making a structural beam of compressed glued wood chips comprising the steps of:

preparing on a support surface a bed of glue-coated wood chips composed of laterally adjacent longitudinally disposed stringer bodies of similarly oriented chips extending for substantially the full length of the bed, in which bed a stringer body of chips of shape elongate in the principal direction of their fibers and positioned so that their fibers are oriented parallel to the support surface and predominantly in the longitudinal direction of the stringer is disposed on either side of a wider stringer of chips of flat shaped elongated in the principal direction of their fibers and position so that having their fibers oriented in various directions in planes parallel to the support surface of the bed;

heating the bed of wood chips;

compressing the bed of wood chips in a first pressing step subjecting the bed of chips to a pressure at right angles to the support surface for the bed with the wider cross sectional dimension of said beam being parallel to said support surface; and

after the aforesaid pressure has reached a predetermined value, subjecting the bed to a pressure greater than the aforesaid pressure and directed parallel to the supporting surface of the bed and at right angles to the longitudinal direction of the bed and of said stringer bodies.

## 4,213,929
## SOLAR COLLECTOR

Michael J. Dobson, Barnhouse, Kemerton, Tewkesbury, Gloucestershire, England

Continuation-in-part of Ser. No. 692,507, Jun. 3, 1976. This application Sep. 22, 1978, Ser. No. 945,077
Int. Cl.[2] B28B 1/16; F24J 3/02; F28F 3/14
U.S. Cl. 264—129 6 Claims

1. A method of making a concrete solar collector panel having a pattern of internal passageways comprising the steps of:

(a) depositing in a mold for the panel a first layer of fiber reinforced concrete slurry,

(b) placing on said first layer a dissolvable polymer foam core for forming the internal passageways,

(c) depositing a second layer of concrete slurry around said core,

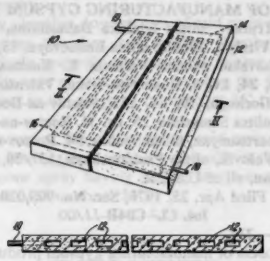
(d) depositing a third layer of fiber reinforced concrete slurry,

(e) releasing the panel from the mold when the concrete has set,

(f) curing the concrete,

(g) drying the panel,

(h) dissolving the polymer foam core in a solvent for the polymer,



(i) causing the solution of solvent and polymer to permeate and coat the concrete surfaces defining the internal passageways,

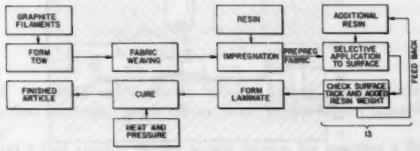
(j) draining the solution out of the internal passageways, and

(k) evaporating the solvent from the solution which remains to form a hardened polymer coating on the surfaces of the internal passageways.

## 4,213,930
## METHOD FOR INCREASING THE SURFACE TACK OF PREPREG MATERIALS

Richard B. Goodrich, Pleasanton, and Richard J. Moulton, Concord, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed May 24, 1978, Ser. No. 909,072
Int. Cl.[2] B29D 3/02; B29G 5/00
U.S. Cl. 264—135 14 Claims




1. A method for forming an article from a resin impregnated fabric, the fabric comprising a multitude of individual filaments distributed over the entire area of the fabric, the method comprising the steps of:

impregnating the fabric with an amount of resin which is less than the desired total amount of resin in the finished article, so that substantially the entire resin is absorbed into the fabric;

thereafter depositing on at least one surface of the impregnated fabric an amount of resin which represents the difference between the desired amount of resin in the finished article and the amount of resin previously impregnated into the fabric by depositing the resin difference at a multitude of individual, spaced apart areas substantially equally distributed over the surface of the fabric in such a manner that the resin difference remains on that surface and renders the surface relatively tacky;

thereafter placing the fabric into a mold so that the relatively tacky surface of the fabric faces a shaping surface of the mold;

adhering the fabric to the shaping surface with the relatively tacky surface of the fabric; and

thereafter subjecting the impregnated fabric while disposed in the mold to the required heat and pressure to conform

the fabric to the shaping surface, to cause the total amount of resin to distribute itself substantially uniformly throughout the fabric, and to cure the resin and thereby finish form the article.

---

**4,213,931**

**PROCESS OF MANUFACTURING GYPSUM PRODUCTS**

**Viktor A. Trutnev, ulitsa letchika Babushkina, 31, kv. 233, Moscow; Vitaly I. Zlobin, ulitsa Koltsevaya, 13, kv. 72, Lobnya Moskovskoi oblasti; Valentin K. Kushnarenko, ulitsa Semashko, 34, kv. 6, Rostov-na-Donu; Valentin B. Ignatov, ulitsa M.Gorkogo, 70, kv. 151, Rostov-na-Donu; Boris V. Gannota, ulitsa Semashko, 25, kv. 34, Rostov-na-Donu; Nikolai S. Ambartsumyan, ulitsa Sedova, 94, Rostov-na-Donu, and Boris B. Volovik, ulitsa Pushkinskaya, 137/50, kv. 15, Rostov-na-Donu, all of U.S.S.R.**

**Filed Apr. 25, 1978, Ser. No. 900,020**

**Int. Cl.² C04B *11/00***

**U.S. Cl. 264—234** **6 Claims**

1. In a process of manufacturing gypsum products comprising crushing of natural dihydrous gypsum $CaSO_4.2H_2O$; molding of the crushed natural dihydrous gypsum; heat treating the molded products; cooling the heat-treated products; and treating the cooled products with water to strengthen the products, the improvement comprising: in the heat treatment, raising the temperature of the molded products from room temperature to a level within the range of 100° to 200° C. at a rate of 2 to 3 degrees per minute, and in the cooling step, cooling the products to a temperature not exceeding 50° C.

---

**4,213,932**

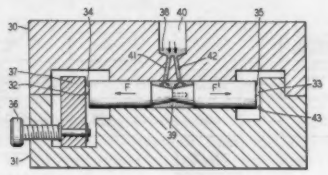
**APPARATUS AND METHOD OF MOLDING A BICONICAL SOCKET**

**William C. Young, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jun. 23, 1978, Ser. No. 918,412**

**Int. Cl.² B29F *1/00***

**U.S. Cl. 264—236** **7 Claims**




7. A method of molding a biconical socket (**10**) of precise length (L or L') and concentricity characterized by the step of

inserting a mandrel assembly within a mold cavity, said mandrel assembly having a first mandrel member (**20**) with a frustoconical end (**22**) and a second mandrel member (**21**) with a frustoconical end (**23**), said frustoconical end of the first mandrel member having a pin (**24**) coaxially extending therefrom, said pin being slidingly accepted by a centrally disposed hole (**25**) in the frustoconical end of said second mandrel member to permit abutment, said pin being fabricated from a material having a thermal coefficient greater than that of the mandrel member material,

heating a preselected mold material to a predetermined temperature sufficient to soften the mold material as well as heat the mandrel material to thereby substantially reduce the clearance between said pin and hole and injecting said mold material into said mold cavity, said mold material being injected into the mold cavity under pressure to produce opposing forces (F, F') parallel to the longitudinal axis of said mandrel members thereby forcing said mandrel members slightly apart, and

removing said mandrel assembly and the molded biconical socket from said mold cavity and said socket from said mandrel assembly.

---

**4,213,933**

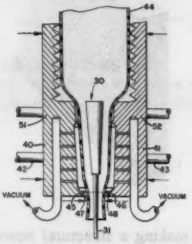
**METHOD OF MAKING A BLOW MOLDED CONTAINER HAVING AN INSERT MOLDED IN SITU**

**Orlando D. Cambio, Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.**

**Filed Mar. 15, 1978, Ser. No. 886,714**

**Int. Cl.² B29C *17/07*; B29D *3/00***

**U.S. Cl. 264—515** **20 Claims**




1. A method for producing a blow molded thermoplastic container having an insert therein comprising:

(a) positioning an insert having an elongated stem extending from the insert between open parts of a multipart mold having confronting cavities against which thermoplastic material is to be blown, such that a portion of said stem depends below said cavities;

(b) providing temporary supporting means for said insert means external of said mold;

(c) extruding heated tubular thermoplastic material between said parts of said multipart mold and around said insert in spaced relationship;

(d) closing said mold thereby pressurizing to drive inwardly radially a portion of said tubular thermoplastic material to adhere to at least a portion of said insert, and severing the stem portion depending below said cavities;

(e) applying pressure internally or vacuum externally of said tubular thermoplastic material to drive said tubular thermoplastic material against the cavities of said mold to form a container;

(f) thereafter opening the mold to free the blow molded thermoplastic container.

---

**4,213,934**

**USE OF PHOSPHORYLATED OXYALKYLATED POLYOLS IN CONJUNCTION WITH SULFITE AND BISULFITE OXYGEN SCAVENGERS**

**Thomas J. Bellos, Kirkwood, Mo., and James E. Davis, Houston, Tex., assignors to Petrolite Corporation, St. Louis, Mo.**

**Filed Mar. 16, 1978, Ser. No. 887,148**

**Int. Cl.² C09K *15/32*; C23F *11/08, 11/16, 11/18***

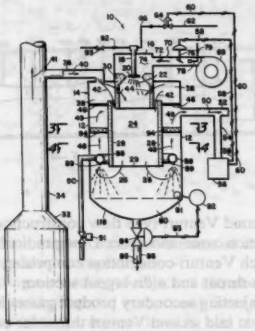
**U.S. Cl. 422—15** **11 Claims**

1. In a process of inhibiting corrosion of ferrous surfaces in an oxygenated aqueous system wherein oxygen scavengers of the sulfite and bisulfite type are employed, the improvement which comprises adding thereto a minor amount of phosphorylated oxyalkylated polyol which is sufficient to substantially prevent the precipitation of the sulfite or bisulfite without substantially affecting its oxygen scavenging properties.

## 4,213,935
## APPARATUS FOR USE IN CONJUNCTION WITH BOILER FLUE GASES FOR GENERATING INERT BLANKETING GASES

Hershel E. Goodnight, and Alan D. Witwer, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jun. 19, 1978, Ser. No. 916,767
Int. Cl.[2] B01J 7/00
U.S. Cl. 422—111 10 Claims



1. Apparatus for use in conjunction with boiler flue gases for generating low oxygen contents inert blanketing gases, comprising:

(a) Combustion chamber means, and means to supply controlled fuel to a burner means to form a downflowing flame, in said combustion chamber;

(b) means to supply boiler flue gases to said combustion chamber;

(c) means to supply controlled air to said combustion chamber;

(d) means to flow the products of combustion of said flame upwardly in an annular space between said combustion chamber and the wall of a containing vessel;

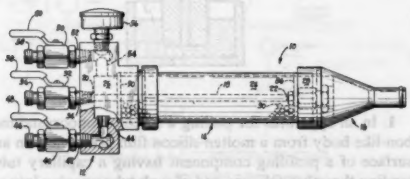
(e) means to provide a downgoing spray of water, countercurrent in said annular space to cool said upflowing products of combustion, to form cooled inert exit gases;

(f) means to monitor the percentage of oxygen in said inert exit gases; and means to control the supply of fuel, and the supply of air responsive to said oxygen monitor.

## 4,213,936
## FOAM GENERATING AND SPRAYING APPARATUS

Robert Lodrick, 6721 Sunset Ave., Independence, Ohio 44131

Filed Aug. 9, 1978, Ser. No. 932,120
Int. Cl.[2] B01F 17/52; B05B 7/04, 7/06, 7/12
U.S. Cl. 422—133 20 Claims



1. A foam generating and spraying apparatus adapted to receive a quantity of hardenable polymeric resin and a foaming agent therefor, and discharge the foamed product thereof, said apparatus comprising:

(a) a resin conduit having inlet and outlet ends;

(b) a foaming chamber having inlet and outlet ends, said foaming chamber being disposed coaxially with respect to said resin conduit;

(c) resin inlet means upstream of said resin conduit for admitting a quantity of pressurized resin thereto;

(d) foaming agent inlet means upstream of said foaming chamber for admitting a quantity of pressurized foaming agent thereto;

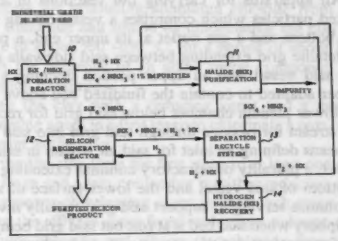
(e) a mixing chamber downstream of said resin conduit and said foaming chamber, said mixing chamber including progressively inwardly sloping walls joining a discharge tube at the apex of said mixing chamber, the slope of said walls being in the range of from about 15° to about 30°; and,

(f) spray means at the outlet end of said resin conduit for spraying resin against said sloping walls in the form of a hollow cone spray having a spray angle in the range of from about 45° to about 56°.

## 4,213,937
## SILICON REFINERY

Francois A. Padovani, Dallas; Michael B. Miller, Richardson; James A. Moore, Dallas; James H. Fowler; Malcom N. June, both of, Plano, all of Tex.; James D. Matthews; T. R. Morton; Norbert A. Stotko, and Lewis B. Palmer, all of Denver, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 494,005, Jul. 31, 1974, Pat. No. 4,092,446.
This application Sep. 22, 1976, Ser. No. 726,018
Int. Cl.[2] B01J 8/18; C01B 33/00
U.S. Cl. 422—142 28 Claims




1. A closed cycle silicon refinery system for producing purified electronic grade silicon from impure silicon comprising:

(a) a first reactor having means therein for reacting a first stream comprised of hydrogen halide with said impure silicon to produce a second impurity containing effluent stream of halosilane and/or silicon halide and a third effluent stream comprised of hydrogen and unreacted hydrogen halide;

(b) purification means for removing impurities from said second stream to produce a fourth effluent stream of purified halosilane and/or silicon halide, and means coupling said purification means with said first reactor for receiving said second stream;

(c) a second reactor having means therein for reacting said fourth stream with a fifth stream comprised of hydrogen to produce said purified electronic grade silicon and a sixth effluent stream comprised of hydrogen halide and unreacted hydrogen, and means coupling said second reactor with said purification means to receive said fourth stream;

(d) separation means for separating a mixture of hydrogen and hydrogen halide to produce said first stream of hydrogen halide and said fifth stream of hydrogen, and means coupling said separation means with said first reactor to receive said third stream and with said second reactor to receive said sixth stream;

(e) means in fluid communicaton with said separation means

and said first reactor for passing said first stream to said first reactor; and

(f) means in fluid communication with said separation means and said second reactor for passing said fifth stream to said second reactor.

---

**4,213,938**

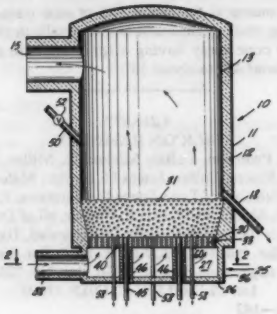
## FLUID BED REACTOR

**Robert Pyzel, 85 E. End Ave., New York, N.Y. 10028**

**Filed Mar. 29, 1976, Ser. No. 671,523**

**Int. Cl.[2] B01J *8/24, 8/44***

**U.S. Cl. 422—143** **1 Claim**



1. An apparatus for carrying out reactions in a body of fluidized particles which comprises a vessel having sidewalls and a bottom and a gas outlet at its upper end, a perforated non-metallic grid extending between said sidewalls and separating said vessel into an upper portion defining a reaction chamber adapted to contain the fluidized bed above said grid and a lower plenum chamber below said grid for reception of an air stream for passage through said grid into said fluidized bed, means defining an inlet for said air stream in said plenum chamber, a plurality of refractory columns extending between the bottom of said vessel and the lower surface of said grid, said columns serving to support said grid radially inwardly of its periphery when said bed is at rest but said grid being susceptible of movement out of contact with said columns when air streams pass into said chamber and flow upwardly through said grid to fluidize said fluid bed at elevated temperatures, each of said columns having an internal axial bore and being defined by vertically superposed annular segments, at least one set of metallic conduit means for supplying fuel and reactant to said fluidized bed, at least some of the conduits passing axially through said bores in said refractory columns with sufficient clearance that the conduits can move freely in said bores in response to expansion and contraction forces brought about by temperature changes, said conduits thereby providing means for supplying reactants and fuel to the fluidized bed and simultaneously stabilizing the columns against displacement under reaction conditions.

---

**4,213,939**

## DOUBLE VENTURI CARBON BLACK REACTOR SYSTEM

**Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia B. Ruble, executrix), assignor to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.**

**Filed Jul. 1, 1977, Ser. No. 812,345**

**Int. Cl.[2] F01C *21/00, 5/00***

**U.S. Cl. 422—151** **1 Claim**

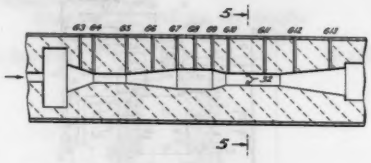
1. An apparatus for the production of carbon black comprising:

a reactor housing defining a longitudinally extending reactor tunnel of generally circular cross-sectional configuration and varying diameter;

said reactor tunnel comprising a combustion zone, a reaction zone, and a quench zone in contiguous axial alignment;

means for introducing fluid fuel and oxidant gas into said combustion zone for combustion therein to produce hot combustion products for flow downstream through said reactor tunnel;

means for injecting hydrocarbon feed stock into said reaction zone of said reactor tunnel for admixture with said hot flowing products of combustion to produce carbon black;



first and second Venturi-type flow constructions disposed in said reaction zone and spaced longitudinally from each other, each Venturi-constriction comprising a convergent section, a throat and a divergent section;

means for injecting secondary product gasses into said reaction zone at said second Venturi throat for controlling the effective area of said throat;

means in said quench zone for injecting quench water to cool the combustion products and reactants; and

collection means downstream from said quench zone to separate the carbon black produced in said reactor from off gasses.

---

**4,213,940**

## APPARATUS FOR PULLING MONOCRYSTALLINE RIBBON-LIKE BODIES OUT OF A MOLTEN CRYSTALLINE FILM

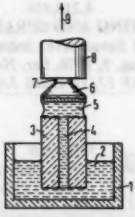
**Manfred Zerbst, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jul. 19, 1977, Ser. No. 817,068**

**Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632614**

**Int. Cl.[2] B01J *17/18***

**U.S. Cl. 422—246** **1 Claim**



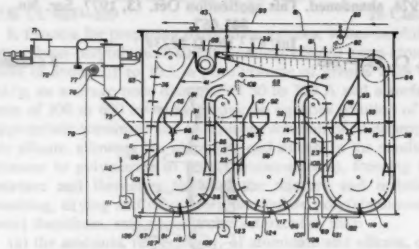
1. In an apparatus for pulling a silicon monocrystalline ribbon-like body from a molten silicon film positioned on an end surface of a profiling component having a capillary tube extending therethrough, one end of such tube opening into a melt reservoir having molten silicon therein and the other end of such tube terminating at the profiling component end surface, the improvement comprising wherein:

at least surfaces of the profiling component forming walls of the capillary tube and surfaces in contact with the molten silicon are composed of a monocrystalline sapphire.

## 4,213,941
## SOLVENT IMMERSION EXTRACTOR

Merton E. Boomer, 1473 Vista Grand Dr., San Leandro, Calif. 94577

Filed Dec. 4, 1978, Ser. No. 965,986
Int. Cl.[2] B01D *11/02*
U.S. Cl. 422—267 6 Claims



1. An immersion extractor for solid material containing an extractable component comprising:

means providing a plurality of adjacent chambers for liquid solvent for extracting said component from said material and for maintaining a solvent level in said chambers;

means for partitioning off a substantially vertical entryway at one side of each of said chambers and a substantially vertical exitway at the opposite side of each of said chambers maintaining a quiescent solvent surface therebetween;

a continuous conveyor for displacing said material through said chambers and being mounted for downward movement through said entryways and for upward movement through said exitways without disturbing said quiescent surface and having a return leg overhead of said chambers;

baffle means mounted between said quiescent solvent surface and said return leg and formed to divert falling solid material away from said quiescent surface and into one of said entryways; and

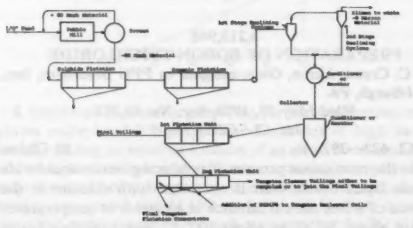
said first-named means including an outlet for decanting said solvent at said quiescent surface.

---

## 4,213,942
## PROCESS FOR THE CONCENTRATION OF MINERAL BY FLOTATION PROCESS

Edward W. J. Thornton, Bathurst, Canada, assignor to Groupe Minier Sullivan Ltee/Sullivan Mining Group Ltd., Canada

Filed Jan. 23, 1978, Ser. No. 871,511
Int. Cl.[2] B01D *11/02*; B03B *7/00*
U.S. Cl. 423—53 3 Claims



1. A process for the recovery of wolframite and/or cassiterite which comprises:

grinding a wolframite and/or cassiterite bearing rock with coarse pieces of said rock and removing −80 mesh material,

floating off sulphides from the ground material,

desliming the sulphides free ground material to remove substantially all minus 8 micron material still present in the ground material, thereby forming a pulp,

conditioning the deslimed sulphides free pulp by a treatment selected from the group consisting of aerating with air agitation and conditioning with mechanical agitation, in the presence of about 2 to 3 pounds per ton of a substance selected from the group consisting of hydrofluoric acid, hydrofluosilicic acid and lactic acid, added as such,

activating the pulp by means of another treatment during about twenty minutes to about three hours in the presence of about 0.2 to about 2.50 pound per ton of pulp of one single emulsified collector selected from the group consisting of an emulsified fatty acid type collector and an emulsified organic phosphoric acid base collector, a paratolyl arsenic acid collector and a hyxroxamic acid collector and

floating said further activated pulp during about 5 to about 15 minutes at a pH ranging from about 5.5 to about 6.5, to recover said wolframite and/or cassiterite.

---

## 4,213,943
## PRODUCTION OF ALUMINUM CHLORIDE FROM CLAY USING STAGED REACTORS

Edward S. Martin, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 22, 1978, Ser. No. 972,468
Int. Cl.[2] C01F *7/56, 7/58*
U.S. Cl. 423—135 8 Claims

1. A process for producing aluminum chloride from clay containing aluminum and silicon by chlorinating the clay at a temperature of about 550°–650° C. for a period of about 1½ to 2½ hours in the presence of an alkali metal compound as a catalyst, which comprises:

contacting the clay with a reducing agent and a gaseous chlorinating agent in a first stage to chlorinate a part of the aluminum in the clay,

transferring the clay from the first stage to at least one additional stage and again contacting it with a reducing agent and a gaseous chlorinating agent in each such stage,

collecting the effluent gases from each stage and separating aluminum chloride and silicon tetrachloride from such gases,

recycling silicon tetrachloride which is separated from the effluent gases back into each stage for contacting the clay, and

providing separate feed of silicon tetrachloride and chlorinating agent to each stage of the process and regulating the relative proportions of silicon tetrachloride and chlorinating agent in each feed to maximize production of aluminum chloride and minimize chlorination of silicon in the clay.

---

## 4,213,944
## PROCESS FOR REMOVING NITROGEN OXIDES FROM GAS BY AMMONIA

Shigeru Azuhata, Hitachi; Hidetoshi Akimoto, Toksimura; Hideo Kikuchi, Hitachi; Yukio Hishinuma, Hitachi; Ryoichiro Oshima, Hitachi, and Yoshijiro Arikawa, Kure, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 9, 1977, Ser. No. 859,176
Claims priority, application Japan, Dec. 10, 1976, 51-147747
Int. Cl.[2] B01D *53/00*
U.S. Cl. 423—235 28 Claims

1. A process for removing nitrogen oxides from a gas containing nitrogen oxides, which comprises adding a reducing agent selected from the group consisting of ammonia, ammonium salts, amines and amides and hydrogen peroxide to the gas, the gas having a temperature of 400°–1200° C., thereby decomposing the nitrogen oxides to a nitrogen gas and water.

## 4,213,945
## PROCESS AND APPARATUS TO PURIFY WASTE INDUSTRIAL GASES

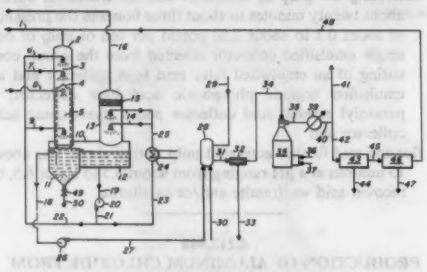
Egon Haese, Bochum; Hans Moll, Marl, and Rolf Willms, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,707

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708919

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 17 Claims



1. A process to purify industrial waste gases containing sulfur dioxide together with other polluting constituent gases selected from the group consisting of hydrogen fluoride, hydrochloric acid and sulfur trioxide, said process including the steps of:

increasing the dew point of industrial waste gases as a first stage within a reaction tank by the partial evaporation therewith of a solution of ammonium sulfate containing ammonium ions,

cooling the gases below the elevated dew point with a solution of ammonium sulfate as a second stage in the reaction tank,

supplying oxygen and/or $NO_X$ into said reaction tank and treating the cooled gases with an ammonia mist as a third stage in the reaction tank to form ammonium salts from the polluting constituent gaseous content of the treated gases,

delivering the treated gases as a fourth stage into the bottom of the reaction tank to precipitate the ammonium salts therefrom by treatment of the polluting constituent gaseous content with a solution of ammonium sulfate containing ammonium ions,

collecting the precipitated ammonium salts below said fourth stage in a reservoir, and

feeding the purified waste gases from the reaction tank through a cooler for discharge into the atmosphere.

---

## 4,213,946
## PROCESS FOR PREVENTING FORMATION OF GYPSUM SCALE IN A FLUE GAS DESULFURIZATION PROCESS

Isao Furuta; Kazuhito Yagaki, and Toyohiko Masuda, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 19, 1977, Ser. No. 861,973

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657971

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 3 Claims

1. In a process for desulfurizing flue gas containing $SO_2$ by the lime-gypsum process wherein said $SO_2$ is absorbed in an aqueous solution of $Ca(OH)_2$ containing $CaCl_2$, the improvement comprising maintaining the concentration of $Ca(OH)_2$ in said absorbing solution at a level between 0.001% and 0.1% by weight and maintaining the concentration of $CaCl_2$ in said absorbing solution at less than 40% by weight, whereby the formation of gypsum scale is prevented.

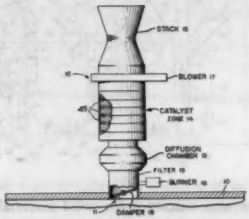
## 4,213,947
## EMISSION CONTROL SYSTEM AND METHOD

Henry A. Fremont, and Edward F. Hedrick, both of Hamilton, Ohio, assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 594,945, Jul. 10, 1975, abandoned, which is a division of Ser. No. 513,452, Oct. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 433,783, Jan. 16, 1974, abandoned. This application Oct. 13, 1977, Ser. No. 841,667

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—245 5 Claims




1. A method of treating for removal of pollutants from an effluent gaseous emission containing organic materials derived from an outlet of a dryer for drying wood-type products within an in-line, non-recirculating flow path connecting said outlet and a stack for venting a treated stream to the atmosphere comprising raising the temperature of said gaseous emission to a temperature within a range of temperatures effective both for catalytic action and for maintaining said entrained organic materials at a temperature prior to catalytic oxidation above that temperature at which condensation of said organic materials may occur, filtering said gaseous emission to remove therefrom particulate of gross size, adjusting the flow of said gaseous emission to provide substantially a uniform laminar flow across the area of flow path, heating a catalyst bed across substantially the area of the face against which said adjusted flow of gaseous emission is flowing to a temperature of from about 100° to about 150° F. above the temperature to which said gaseous emission was first heated both to maintain the temperature of said gaseous emission within said range and increase catalytic activity of said catalyst bed, catalytically oxidizing substantially all the organic materials in said gaseous emission, and then discharging continually to the atmosphere the treated stream caused to pass through said catalyst bed which shall be substantially equal in volume to the volume of said effluent gaseous emission which shall enter said flow path by applying negative pressure in said flow path downstream of said catalyst bed.

---

## 4,213,948
## PREPARATION OF BORON TRICHLORIDE

John C. Crano, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 29, 1979, Ser. No. 43,292

Int. Cl.[2] C01B *35/06*

U.S. Cl. 423—292 18 Claims

1. In the continuous process of producing boron trichloride wherein liquid borate ester is contacted with chlorine in the presence of a free radical initiator in a reactor at temperatures of from about 20° C. to about 100° C. and vaporous boron trichloride is removed from the reactor, the improvement which comprises removing a purge fraction of the liquid reaction mixture from the reactor, distilling liquid reaction mixture removed from the reactor, and recycling distillate obtained from the distillation to the reactor.

## 4,213,949
## PROCESS OF PREPARING PARTICULATE POLY(ALUMINO-SILICATE)

Walter Mahler, and William O. Forshey, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1978, Ser. No. 972,421
Int. Cl.[2] C01B *33/26, 33/28*
U.S. Cl. 423—329 16 Claims

1. Process for preparing particulate, porous, water-insoluble amorphous poly(alumino-silicate) having a Si/Al gram-atomic ratio of about 1:1 to 10:1, a pore volume of greater than 0.5 ml/g, an average pore diameter of 50 to 200 A and a surface area of 200 to 600 $m^2/g$ by mixing an aqueous solution of an appropriate aluminate and an aqueous solution of an appropriate silicate, allowing the aluminate and silicate in the resultant mixture to polymerize to poly(alumino-silicate), freezing the mixture and thereafter thawing the mixture and isolating, washing, drying and recovering particulate poly(alumino-silicate) therefrom, said process characterized in that:

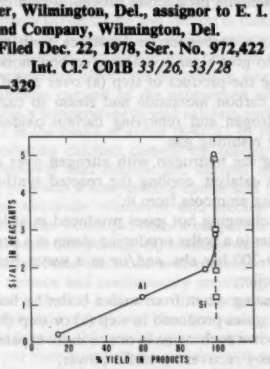
(a) the amounts, respectively, of aluminate and silicate, calculated as $Al_2O_3$ and $SiO_2$, are such that the total amount thereof in the mixture is about 4 to 25 weight % of the mixture, such that the Si/Al gram-atomic ratio in the mixture is about 1:1 to 10:1, and such that the amount, in the mixture, of at least one water-soluble compound which is precipitable from the mixture at $-10°$ to $-100°$ C. and which is inert to the aluminate, silicate and poly(alumino-silicate) is about 25 to 160 weight %, based on the combined weights of aluminate and silicate, calculated as $Al_2O_3$ and $SiO_2$; and

(b) the mixture is cooled to about $-10°$ to $-100°$ C. until it is frozen, to separate substantially all of the chemically unbound water as substantially pure ice and to precipitate water-soluble compound within the pores of the poly(alumino-silicate) particles being formed.

## 4,213,950
## PROCESS FOR PREPARING AMORPHOUS PARTICULATE POLY(ALUMINO-SILICATE)

Walter Mahler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1978, Ser. No. 972,422
Int. Cl.[2] C01B *33/26, 33/28*
U.S. Cl. 423—329 10 Claims




1. Improved process for preparing particulate, porous, amorphous water-insoluble poly(alumino-silicate) of high surface area by mixing an aqueous solution of an alkali metal aluminate and an aqueous solution of a silicon-containing compound, the improvement comprising using silicic acid as the silicon-containing compound and $MAlO_2$, wherein M is alkali metal, as the alkali metal aluminate, in such amounts that the Si/Al ratio provided by the silicic acid and $MAlO_2$ is 2:1 to 100:1, allowing the $MAlO_2$ and silicic acid in the resultant reaction mixture to polymerize to poly(alumino-silicate), and thereafter removing sufficient water from the reaction mixture to permit recovery therefrom, in high yield, of particulate poly(alumino-silicate) having a Si/Al ratio which is substantially the same as the Si/Al ratio provided by the silicic acid and $MAlO_2$ employed in the formation of the reaction mixture.

## 4,213,951
## RECOVERY OF HYDROFLUORIC ACID FROM FLUOSILICIC ACID WITH HIGH PH HYDROLYSIS

Subhas K. Sikdar, San Juan Capistrano, and James H. Moore, La Verne, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Oct. 23, 1978, Ser. No. 953,802
Int. Cl.[2] C01B *33/12, 7/22;* C01D *3/02*
U.S. Cl. 423—339 29 Claims

1. A method for recovering sodium fluoride and solid amorphous silica from an aqueous solution of fluosilicic acid comprising the steps of:

(a) reacting in a first precipitation zone fluosilicic acid in aqueous solution with sufficient sodium hydroxide to form a first alkaline aqueous slurry having a pH of from about 11 to about 14 and comprising sodium metasilicate and precipitated sodium fluoride;

(b) recovering precipitated sodium fluoride from the first alkaline aqueous slurry leaving an aqueous solution comprising sodium metasilicate;

(c) combining the aqueous solution comprising sodium metasilicate in a second precipitation zone with fluosilicic acid or sodium fluosilicate or both to form a second alkaline aqueous slurry comprising amorphous silica and dissolved sodium fluoride by maintaining the pH of the second alkaline aqueous slurry at a value greater than 7 and up to about 9; the second alkaline aqueous slurry being at least saturated with sodium fluoride, and the temperature of the second alkaline aqueous slurry being substantially equal to its boiling point so that the second alkaline aqueous slurry contains precipitated amorphous silica;

(d) separating precipitated amorphous silica from the second alkaline aqueous slurry leaving an aqueous solution of sodium fluoride; and

(e) recovering sodium fluoride from the aqueous solution of sodium fluoride.

## 4,213,952
## RECOVERY OF HYDROFLUORIC ACID FROM FLUOSILICIC ACID WITH HIGH PH HYDROLYSIS

Subhas K. Sikdar, San Juan Capistrano, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Oct. 23, 1978, Ser. No. 954,066
Int. Cl.[2] C01B *33/12, 7/22;* C01D *3/02*
U.S. Cl. 423—339 32 Claims

1. A method for recovering sodium fluoride and solid amorphous silica from an aqueous solution of fluosilicic acid comprising the steps of:

(a) reacting fluosilicic acid in aqueous solution with sodium sulfate to form sodium fluosilicate in a purification zone;

(b) reacting in a first precipitation zone the formed sodium fluosilicate with sufficient sodium hydroxide to form a first alkaline aqueous slurry having a pH of from about 11 to about 14 and comprising sodium metasilicate and precipitated sodium fluoride;

(c) recovering precipitated sodium fluoride from the first aqueous alkaline slurry leaving an aqueous solution comprising sodium metasilicate;

(d) combining the aqueous solution comprising sodium metasilicate in a second precipitation zone with fluosilicic acid or sodium fluosilicate or both to form a second alkaline aqueous slurry comprising amorphous silica and dissolved sodium fluoride by maintaining the pH of the second alkaline aqueous slurry at a value greater than 7 and up to about 9; the second alkaline aqueous slurry being at least saturated with sodium fluoride, and the temperature of the second alkaline aqueous slurry being substantially equal to its boiling point so that the second slurry contains precipitated amorphous silica;

(e) separating precipitated amorphous silica from the second alkaline aqueous slurry leaving an aqueous solution of sodium fluoride; and

(f) recovering sodium fluoride from the aqueous solution of sodium fluoride.

---

**4,213,953**

## PROCESS FOR THE PREPARATION OF AMMONIA AND HEAVY WATER

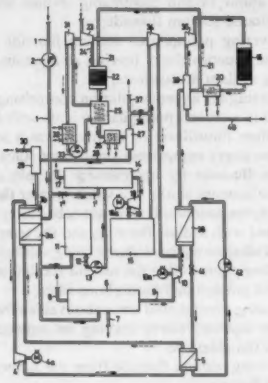
**Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed May 12, 1977, Ser. No. 796,170**

**Claims priority, application Switzerland, May 13, 1976, 6020/76**

**Int. Cl.[2] C01C *1/04***

**U.S. Cl. 423—359** **2 Claims**



1. A process for the production of ammonia and heavy water, said process comprising the steps of

enriching a flow of water with deuterium in a monothermal isotropic process;

supplying a first portion of the deuterium-enriched water to a heavy water preparation plant to produce heavy water and hydrogen;

storing a second portion of the deuterium-enriched water substantially without interruption during the colder half of a year;

electrolytically dissociating the stored deuterium-enriched water substantially without interruption during the warmer half of a year to form hydrogen;

storing a portion of the electrolytically-produced hydrogen during said warmer half of a year while supplying the remainder to a synthesis circuit of a synthesizing plant and subsequently supplying the stored hydrogen to the synthesis circuit during said colder half of a year;

removing some of the synthesis gas mixture from the synthesis circuit of the synthesizing plant;

burning the removed synthesis gas mixture with air to produce a mixture consisting mainly of water and nitrogen;

thereafter condensing and separating the water from the mixture of water and nitrogen;

supplying the nitrogen of the mixture of water and nitrogen, the hydrogen from the heavy water preparation plant and the electrolytically-produced hydrogen to the synthesis circuit of the synthesizing plant to produce ammonia; and

collecting deuterium-depleted water resulting from said burning step and feeding the collected deuterium-depleted water into the monothermal process.

**4,213,954**

## AMMONIA PRODUCTION PROCESS

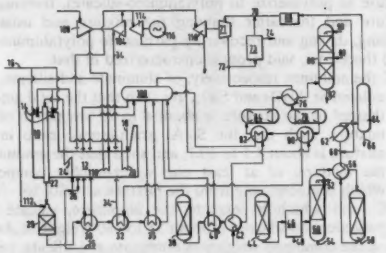
**Alwyn Pinto, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Sep. 5, 1978, Ser. No. 939,916**

**Claims priority, application United Kingdom, Sep. 16, 1977, 38713/77**

**Int. Cl.[2] C01C *1/04***

**U.S. Cl. 423—359** **7 Claims**



1. In an ammonia production process which comprises the steps of

(a) reacting a carbonaceous feedstock with steam and/or oxygen to give a gas containing carbon monoxide;

(b) reacting the product of step (a) over a shift catalyst to convert carbon monoxide and steam to carbon dioxide and hydrogen and removing carbon oxides and steam from the resulting gas;

(c) reacting the hydrogen with nitrogen over an ammonia synthesis catalyst, cooling the reacted synthesis gas and recovering ammonia from it;

(d) heat exchanging hot gases produced in at least step (c) with water in a boiler producing steam at a pressure in the range 60–200 bar abs. and/or in a water heater feeding such a boiler;

(e) superheating steam from such a boiler by heat exchange with hot gases produced in step (a) or step (b); and

(f) letting down such steam in one or more expansion engines and thereby recovering useful power,

said process being previously subject to the defect that an accidental shut down of ammonia synthesis in step (c) decreases the supply of steam from step (d) and thus causes overheating of the heat exchangers providing superheating in step (e);

in step (c) (i) reacting and cooling the synthesis gas at a pressure under 150 bar abs., and

(ii) cooling the reacted synthesis gas at least partly by superheating steam produced in step (d) and/or reheating steam within or from one or more of the engines of step (f) whereby such a decrease in said supply of steam is accompanied by a compensating decrease in superheating capacity.

4,213,955

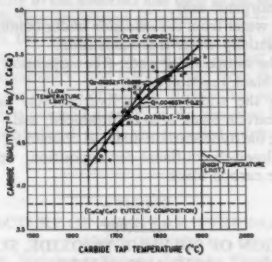
# COMPUTERIZED PROCESS AND APPARATUS FOR USE WITH A SUBMERGED ARC ELECTRIC FURNACE TO PRODUCE METALLURGICAL PRODUCTS

Ralph A. Casciani, Tonawanda; Wilmer L. Wilbern, Niagara Falls; William E. Mangan, Bronxville, all of N.Y., and Paul D. Franson, St. Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 712,275, Aug. 6, 1976, abandoned, which is a continuation of Ser. No. 363,581, May 24, 1973, abandoned, which is a continuation of Ser. No. 77,853, Oct. 5, 1970, abandoned. This application Nov. 23, 1977, Ser. No. 854,257

Int. Cl.[2] C01B *31/32*

U.S. Cl. 423—442 1 Claim




1. In a process for the feeding of lime and carbon into an electric arc furnace to produce a calcium carbide product, said electric arc furnace having, in combination, (i) at least one vertical hollow electrode penetrating said furnace and embedded in a mixture of carbon and lime in proportions to provide a submerged arc calcium carbide-forming reaction zone extending substantially from about the lower tip of said electrode to the hearth of said furnace wherein molten calcium carbide is produced (ii) electrically actuatable feeding means for selectively feeding finely divided lime, or finely divided carbon, or a mixture of finely divided lime and carbon in calcium carbide-forming proportions through said hollow electrode into said submerged arc calcium carbide-forming reaction zone and (iii) electrically acttuatable electrode positioning means for maintaining the electric current of the submerged arc at a value which provides a temperature in said calcium carbide-forming reaction zone in the range of about 1640° C. to 1900° C. sufficient for producing calcium carbide by raising said hollow electrode whenever said electric arc current increases to a value which provides a temperature above said range and by lowering said electrode whenever said electric arc current decreases to a value which provides a temperature below said range, said process comprising, (a) continuously detecting the vertical position of said electrode with respect to the hearth of said electric furnace and continuously providing an electrical signal in relation thereto indicative of the position of the electrode tip within said electric arc furnace with respect to said hearth of said furnace, (b) providing an electrical signal indicative of an upper limit electrode tip position with respect to said hearth and a lower limit electrode tip position with respect to said hearth, such that said electrode is embedded in said mixture of lime and carbon, when within said limits and the electric arc current thereby established provides a temperature in the range specified in (iii) above, (c) continuously electrically comparing the electrical signal recited in (a) with the electrical signal recited in (b) and when (i) such electrical comparison indicates an electrode tip position higher than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only lime through said hollow electrode into said submerged arc reaction zone to increase the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to decrease, such decrease in current causing said electrode positioning means to automatically lower the electrode and thereby re-establish the electrode tip position below said predetermined upper limit position (ii) such electrical comparison indicates an electrode tip position lower than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only carbon through said hollow electrode into said submerged arc reaction zone to decrease the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to increase, such increase in current causing said electrode positioning means to automatically raise the electrode and thereby re-establish the electrode tip position above said predetermined lower limit position (iii) such electrical comparison indicates an electrode tip position within said upper and lower limit positions providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed a predetermined mixture of lime and carbon through said hollow electrode into said submerged arc reaction zone; the improvement whereby the quality of the calcium carbide product is continuously monitored and regulated which improvement comprises,

(I). continuously measuring the temperature of molten calcium carbide product within said electric furnace and continuously providing an electrical signal in relation thereto, said signal being indicative of the quality of said molten calcium carbide product;

(II). providing an electrical signal indicative of the desired calcium carbide quality in correlation with the electrical signal of (I) when the calcium carbide quality expressed as Q satisfies one of the following equations and indicative of lower or higher than desired calcium carbide quality when the following equations are not satisfied:

$$Q=(0.00715T-7.52)\pm 10\%$$

for a measured calcium carbide temperature (T) expressed in degrees centigrade indicated by the electrical signal of (I) in the range of about 1640° C. and about 1760° C., and

$$Q=(0.00252T-0.67)\pm 10\%$$

for a measured calcium carbide temperature (T) expressed in degrees centigrade by the electrical signal of (I) in the range of about 1760° C. and 1900° C.;

(III). continuously electrically comparing the electrical signal recited in (I) with the electrical signal recited in (II) and when (i) such comparison indicates that the quality of calcium carbide product in said electric furnace is lower than the desired quality while concurrently the comparison of electrical signals recited in (c) indicates an electrode tip position higher than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only lime through said hollow electrode into said submerged arc reaction zone to increase the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to decrease, such decrease in current causing said electrode positioning means to automatically lower the electrode and thereby re-establish the electrode tip position below said upper limit position (ii) such comparison indicates that the quality of calcium carbide product in said electric furnace is lower than the desired quality while concurrently the comparison of electrical signals recited in (c) indicates an electrode tip position equal to or lower than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only carbon through said hollow electrode into said submerged arc reaction zone to decrease the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to increase, such increase in current causing said electrode positioning means to automatically raise the electrode and thereby re-establish the current in said range and also to increase the ratio of carbon to lime and

thereby increase the reduction of lime to carbide and consequently increasing the quality of the carbide product, (iii) such comparison indicates that the quality of calcium carbide product in said electric furnace is higher than the desired quality while concurrently the comparison of electrical signals recited in (c) indicates an electrode tip position equal to or higher than the desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only lime through said hollow electrode into said submerged arc reaction zone to increase the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to decrease, such decrease in current causing said electrode positioning means to automatically lower the electrode and thereby re-establish the current in said range and also to decrease the ratio of carbon to lime and thereby decrease the reduction of lime to carbide and consequently decreasing the quality of the carbide product, (iv) such comparison indicates that the quality of calcium carbide product in said electric furnace is equal to the desired quality while concurrently the comparison of electrical signals recited in (c) indicates an electrode tip position higher than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only lime through said hollow electrode into said submerged arc reaction zone to increase the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to decrease, such decrease in current causing said electrode positioning means to automatically lower the electrode and thereby re-establish the current in said range, (v) such comparison indicates that the quality of calcium carbide product in said electric furnace is equal to the desired quality while concurrently the comparison of electrical signals recited in (c) indicates an electrode tip position lower than that desired, providing an electrical signal in response to such electrical comparison to actuate said feeding means to feed only carbon through said hollow electrode into said submerged arc reaction zone to decrease the resistance of the mixture of lime and carbon in said electric furnace thereby causing the electric arc current to increase, such increase in current causing said electrode positioning means to automatically raise the electrode and thereby re-establish the current in said range.

---

**4,213,956**

## GRANITE COMPOSITION

**Alfred R. J. P. Ubbelohde, Platts Farm, Font Ridge Lane, Burwash, East Sussex, England**

**Filed Nov. 15, 1978, Ser. No. 961,024**

**Int. Cl.[2] C01B *31/04***

**U.S. Cl. 423—448** **21 Claims**

1. A method for the production of highly anisotropic and well oriented graphite compositions which method comprises subjecting a dispersion of graphite crystallites in a matrix material to the action of a shear force alone or in combination with a compressive force, the matrix material being in a viscous pasty or plastic form at the temperature at which the shear force is applied and said matrix material including a component A which carbonizes at a temperature above 250° C. to leave not more than 25% by weight of carbon the remainder of component A on carbonization being volatile products and a component B which carbonizes at a temperature above 400° C. to leave at least 50% by weight of carbon in the form of a carbonaceous char comprising meso phase carbon, the difference in carbonization temperatures of said component A and said component B being at least 100° C. and wherein the matrix material comprises from 20 to 80% by weight component A and 80 to 20% by weight component B.

**4,213,957**

## CARBON BLACK PRODUCTION

**Harold R. Hunt, and King L. Mills, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 783,242, Mar. 31, 1977, Pat. No. 4,148,744. This application Dec. 11, 1978, Ser. No. 968,157**

**Int. Cl.[2] C01B *31/02*; C09C *1/48***

**U.S. Cl. 423—450** **8 Claims**

1. A process for the production of carbon black having reduced structure which comprises:

mixing a water solution of an alkali metal inorganic salt with oil wherein said oil has an SUS viscosity at 100° F. above about 50 seconds and an initial boiling point above about 350° F. and a suitable emulsifying agent at conditions which form an emulsion wherein said emulsifying agent is compatible with the other ingredients and forms an emulsion when agitated with a water solution of the alkali metal inorganic salt;

removing water from the emulsion under conditions to form a substantially water-free suspension;

filtering the substantially water-free suspension to produce a carbon black reaction additive;

dispersing the additive in a hydrocarbon material from which carbon black is to be produced; and

subjecting the hydrocarbon material containing said additive to enclosed-direct-flame-decomposition conditions to produce carbon black.

---

**4,213,958**

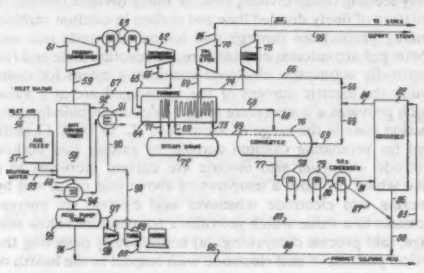
## PRODUCTION OF SULPHUR TRIOXIDE, SULPHURIC ACID AND OLEUM

**Gordon M. Cameron, Sudbury; Frederick W. S. Jones, Rosemere, and Peter D. Nolan, Sudbury, all of Canada, assignors to Canadian Industries Limited, Montreal, Canada**

**Continuation of Ser. No. 443,907, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,189, Oct. 24, 1972, abandoned. This application Nov. 14, 1977, Ser. No. 851,198**

**Int. Cl.[2] C01B *17/72, 17/08***

**U.S. Cl. 423—522** **29 Claims**



1. In a process for making sulphuric acid in which a stream of air is passed through a drying unit where it is dried with a stream of concentrated sulphuric acid, the resulting dry process air is compressed to a pressure of 5 to 50 atmospheres and fed to a converter along with a dry sulphur dioxide-containing process gas stream wherein the sulphur dioxide is catalytically converted to sulphur trioxide and the resulting converted gas stream containing the sulphur trioxide together with a minor amount of unconverted sulphur dioxide is fed to an absorber wherein it is contacted with a stream of a sulphuric acid solution to form further sulphuric acid, the improvement comprising supplying to the absorber a stream of sulphuric acid solution essentially free of sulphur dioxide and passing said acid solution through the absorber countercurrently to the stream of converted gas under conditions whereby the unconverted sulphur dioxide present in the latter is dissolved in the sulphuric acid, reheating at least a portion of the exit gas from the

absorber, and passing said portion of the reheated exit gas through an expander and thereafter discharging to the atmosphere, taking the entire flow of sulphur dioxide-containing sulphuric acid from the absorber and cooling and decompressing it to a pressure within the range of atmospheric pressure to 10 atmospheres but lower than that existing in the absorber by at least 4 atmospheres, passing said entire flow of sulphur dioxide-containing sulphuric acid at the resulting reduced pressure through the drying unit countercurrently to the stream of air which is free of $SO_2$ whereby simultaneously moisture is transferred from the air to the acid and sulphur dioxide is transferred from the acid to said air, using the resulting mixture of sulphur dioxide and dry air as process air, taking the essentially sulphur dioxide-free sulphuric acid stream from the drying unit and dividing it into two portions of which one is withdrawn as product sulphuric acid and the other is pumped directly to the absorber and used as the sulphuric acid solution for further absorption of sulphur dioxide and sulphur dioxide from the converted gas stream, said improvement being further characterized in that the sulphur dioxide absorbed by the sulphuric acid is transferred from the acid to the air such that the portion of sulphur dioxide-free sulphuric acid stream which is pumped directly to the absorber is capable of absorbing essentially all of the unconverted sulphur dioxide in the absorber.

---

**4,213,959**

## MANUFACTURE OF ACICULAR, FERRIMAGNETIC IRON OXIDE

**Rudolf Brodt, Weinheim; Helmut Jakusch; Eberhard Koester, both of Frankenthal; Werner Loeser, Ludwigshafen; Manfred Ohlinger, Frankenthal; Wilhelm Sarnecki, Limburgerhof, and Werner Steck, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Aug. 3, 1978, Ser. No. 930,513**

**Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735316**

**Int. Cl.[2] C01G *49/06***

**U.S. Cl. 423—634** **2 Claims**

1. A process for the manufacture of acicular ferrimagnetic gamma-ferric oxide, comprising:

(a) Dehydrating at a temperature from about 300° to 650° C. a mixture of needle-shaped particles of 60 to 98% by weight of lepidocrocite and 2 to 40% by weight of goethite, said particles having a mean particle size of from 0.2 to 1.5 microns and a length:width ratio of at least 10;

(b) Reducing the particles thus obtained at a temperature of from 300° to 650° C. to magnetite particles by means of an organic compound which decomposes in this temperature range without producing ash or tar; and

(c) Oxidizing the resulting magnetite particles with an oxygen-containing gas at a temperature of from 200° to 500° C. to convert said resulting magnetite particles into acicular ferrimagnetic gamma-ferric oxide particles.

---

**4,213,960**

## COSMETIC COMPOSITIONS FOR TREATING THE HAIR

**Jean-Francois Grollier; Claire Fiquet; Chantal Fourcadier, all of Paris; Claude Dubief, Versailles, and Daniele Cauwet, Crosne, all of France, assignors to L'Oreal, Paris, France**

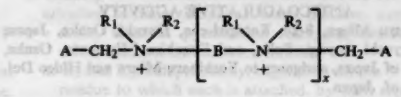
**Filed Mar. 1, 1978, Ser. No. 882,424**

**Claims priority, application France, Mar. 2, 1977, 77 06032**

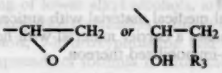
**Int. Cl.[2] A61K *7/06***

**U.S. Cl. 424—47** **30 Claims**

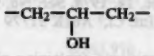
1. A cosmetic composition suitable for treating the hair which comprises: (a) from about 0.1 to about 5.0 percent by weight, based on the weight of the entire composition, of at least one water-soluble polyamino-amide derivative which is a condensation product of a polyalkylenepolyamine with a polycarboxylic acid, which has been alkylated with a bifunctional alkylating agent having the formula:



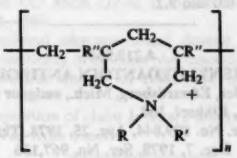
in which x is 0 or an integer from 1 to 7, A denotes a



group in which $R_3$ denotes halogen, $R_1$ and $R_2$ denote independently of one another, an alkyl or hydroxyalkyl group containing 1 to 4 carbon atoms, and B represents an alkylene group containing 2 to 6 carbon atoms, a



group or a group of formula $-(CH_2)_y-NH-CO-N-H-(CH_2)_y-$ in which y is an integer from 1 to 4; (B) from about 0.1 to about 10.0 percent by weight, based on the weight of the entire composition of at least one water-soluble high molecular weight quaternary ammonium polymer containing chain units of the formula:



in which R″ denotes a hydrogen atom or a methyl group, and R and R′ denote, independently of one another, an alkyl group having from 1 to 22 carbon atoms, a hydroxyalkyl group, or a lower amidoalkyl group, or R and R′, together with the nitrogen atom to which they are bonded, denote an heterocyclic group, said units being associated with a cosmetically acceptable anion; and (C) a sufficient amount of a carrier to constitute 100 percent by weight for the total composition in order to form an aqueous solution, an aqueous alcoholic solution, an aqueous-alcoholic-surface active agent solution, an emulsion, a cream, a gel or an aerosol.

---

**4,213,961**

## ORAL COMPOSITIONS

**Stephen N. Curtis, Edison, and Hridaya N. Bhargava, East Brunswick, both of N.J., assignors to Beecham, Inc., Clifton, N.J.**

**Filed Mar. 23, 1978, Ser. No. 889,205**

**Int. Cl.[2] A61K *7/22, 7/24***

**U.S. Cl. 424—54** **17 Claims**

1. An oral composition useful for controlling dental plaque and gingivitis and for preventing caries which comprises from 0.1% to about 1.0% of a cationic antimicrobial agent useful for controlling plaque and gingivitis and for preventing caries selected from the group consisting of a bisbiguanide and a quaternary ammonium compound and from 0.1% to 3.5% of an anti-stain composition which anti-stain composition comprises 0.5% to 1.5% of a nonionic surfactant and 0.5% to 2.0% of ascorbic acid, said ascorbic acid being present in a molar excess of about 10:1 to about 25:1 over the cationic antimicrobial agent, in combination with a pharmaceutically acceptable carrier.

4,213,962

## ARTIFICIAL MEDICAL MATERIAL WITH ANTICOAGULATIVE ACTIVITY

Yoshiharu Miura, 8-28, Katagiri-cho, Ibaraki, Osaka, Japan; Sadayoshi Aoyagi, Suita, and Kazuhisa Miyamoto, Osaka, both of Japan, assignors to Yoshiharu Miura and Hideo Doi, both of, Japan

Filed Jul. 25, 1978, Ser. No. 927,941
Claims priority, application Japan, Jul. 27, 1977, 52-90673
Int. Cl.[2] A61K *31/74, 31/78, 31/70, 31/725*
U.S. Cl. 424—78 13 Claims

1. An artificial medical material with anticoagulative activity which comprises a carrier material with heparin and antithrombin III co-immobilized thereon.

---

4,213,963

## FLUSPIRILENE-CONTAINING COMPOSITIONS

Jean Mesens, Geel, and Victor Haagen, Vosselaar, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Dec. 14, 1978, Ser. No. 969,526
Int. Cl.[2] A61K *31/79*
U.S. Cl. 424—80 2 Claims

1. An aqueous fluspirilene-containing pharmaceutical composition for intramuscular administration which comprises per milliliter of composition from 1.5 to 15 mg of microcrystalline fluspirilene having such a particle size distribution that not less than 50% of the particles have a sphere diameter between 3μ and 10μ and not less than 70% of the particles have a sphere diameter between 2μ and 15μ; from 8 to 40 mg of water-soluble polyvinylpyrrolidone; and from 0.13 to 0.42 millimoles of phosphate buffer, adjusting the pH of the composition to a value between 6.0 and 8.2.

---

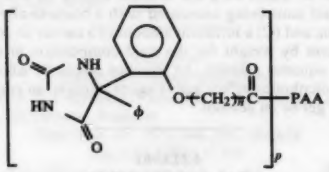
4,213,964

## DIPHENYLHYDANTOIN ANTIBODIES

Robert T. Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 899,844, Apr. 25, 1978. This application Dec. 7, 1978, Ser. No. 967,136
Int. Cl.[2] A61K *39/00;* C07C *103/52;* A61K *45/02*
U.S. Cl. 424—85 3 Claims

1. An antibody prepared against a diphenylhydantoin immunogen conjugate of the formula:



wherein ϕ is phenyl, PAA is an immunogenic polypeptide or protein having a molecular weight of at least 5,000 bonded through an amide linkage, n=2 through 6, and p=1 through 50.

---

4,213,965

## SMALL-PLAQUE VARIANT CANINE HERPESVIRUS VACCINE

Leland E. Carmichael, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 959,808, Nov. 13, 1978, abandoned. This application Jan. 23, 1979, Ser. No. 5,743
Int. Cl.[2] A61K *39/12*
U.S. Cl. 424—89 14 Claims

1. A method of increasing the resistance of dogs to Canine Herpesvirus infection which comprises inoculating susceptible pups or bitches prior to exposure to Canine Herpesvirus with a vaccine comprising a microplaque mP variant which has a plaque size about 0.7 times the diameter of the original Canine Herpesvirus isolate, said mP variant engendering resistance to virulent Canine Herpesvirus induced disease in the pups or the pups of said bitches.

---

4,213,966

## METHOD FOR ISOLATING POLYETHER ANTIBIOTICS

Wen-Chih Liu, Princeton Junction; William E. Brown, and Gail L. Astle, both of Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 2, 1977, Ser. No. 802,768
Int. Cl.[2] A61K *35/00;* C07H *15/22*
U.S. Cl. 424—123 8 Claims

1. A method for isolating a polyether antibiotic selected from the group consisting of lonomycin, monensin, ionomycin, nigericin, lasalocid, salinomycin, and laidlomycin from its fermentation broth, which comprises adjusting the filtrate obtained from filtering of the fermentation broth to a slightly basic pH of within the range of from about 7.2 to about 8, extracting said filtrate with a water-immiscible organic solvent selected from the group consisting of ethyl acetate, butyl acetate, butanol, chloroform, methyl isobutyl ketone and benzene, said water-immiscible organic solvent being employed in a volume ratio to the filtrate of within the range of from about 2:1 to about 1:5, with the extraction being carried out 1 to 4 times; dissolving a concentrated form of the resulting organic phase in an aqueous lower alkanol solvent selected from the group consisting of methanol and ethanol; adjusting the pH of the resulting solution upwards to from about 9 to about 14; adding water to increase the volume of the solution from 1.5 to 3 fold; extracting the solution with a protic solvent selected from the group consisting of pentane, hexane, heptane, ligroin, and petroleum ether; and concentrating the resulting organic phase thereby causing the polyether antibiotic to crystallize out.

---

4,213,967

## PESTICIDE CONTAINING IGNITION INHIBITOR

Werner Praxl, Rimbach, and Reiner Ehret, Weinheim, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg, Chemische Fabrik Delitia Nachf., Laudenbach/Bergstr, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 919,176
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729887
Int. Cl.[2] A01N *11/00*
U.S. Cl. 424—128 4 Claims

1. A pesticide composition containing from about 40 to about 80 percent by weight of a metal phosphide selected from the group consisting of aluminum and magnesium phosphide, from about 15 to about 55 percent by weight of a pelleting agent, and as an ignition inhibiting agent, from about 0.5 to about 10 percent by weight, calculated on the metal phosphide, of a liquid aromatic hydrocarbon having a boiling point between about 130° and about 180° C. selected from the group consisting of hydrocarbons having a benzene or naphthalene nucleus and being substituted with alkyl substituents having from 1 to 4 carbon atoms, compounds with a benzene nucleus having up to 5 alkyl substituents, compounds with a naphthalene nucleus having up to 3 alkyl substituents, or isomeric mixtures of such aromatic hydrocarbons.

---

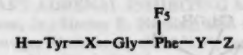
4,213,968

## ENKEPHALIN DERIVATIVES

Abba J. Kastin, 4400 Morales St., Metairie, La. 70002, and David H. Coy, 4319 Perrier St., New Orleans, La. 65115

Filed Jun. 5, 1978, Ser. No. 912,412
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 15 Claims

1. A pentapeptide of the formula



wherein: X is a chiral residue of a D-amino acid selected from the group consisting of D-alanine, D-leucine, D-isoleucine, D-valine, D-norvaline, D-phenylalanine, D-tyrosine, D-tryptophan, D-serine, D-threonine, D-methionine, D-glutamic acid, D-glutamine, D-aspartic acid, D-asparagine, D-lysine, D-proline, D-histidine and D-arginine; Y is methionine or leucine and Z is selected from the group consisting of hydroxy, amino, loweralkylamino, diloweralkylamino and loweralkoxy; and the pharmaceutically acceptable salts thereof.

---

**4,213,969**

## PHOSPHONOUS ACID DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN COMBATTING MICROORGANISMS

**Eric K. Baylis, and Wilfred Pickles, both of Stockport, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

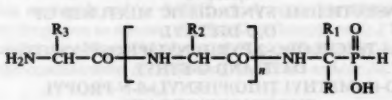
**Filed Nov. 13, 1978, Ser. No. 960,266**

**Claims priority, application United Kingdom, Nov. 19, 1977, 48264/77**

**Int. Cl.[2] A61K** *37/100;* **C07C** *103/52*

**U.S. Cl. 424—177** **33 Claims**

1. A compound having the formula:



(I)

or the corresponding zwitterion form in which R and $R_1$ may be the same or different and each can be hydrogen, deuterium, lower alkyl, lower alkyl substituted by halogen, hydroxy, lower alkoxy, mercapto, carboxyl, S-substituted dithio groups, $—NR_4R_5$ wherein $R_4$ and $R_5$ can be the same or different and each is hydrogen, lower alkyl, guanidino or phenyl, or $R_4$ and $R_5$ together may form a polymethylene chain containing up to 6 carbon atoms which may be interrupted by oxygen or nitrogen, or phenoxy or phenoxy substituted by hydroxy or halogen, lower alkenyl, lower alkynyl, $C_3$–$C_7$ cycloalkyl, phenyl, phenyl substituted by loweralkyl, hydroxy, lower alkoxy or halogen, aziridine, oxetane, thiophene, furan, pyridine, azepine, isoxazole, thiazole, pyrimidine, diazepine, thiadiazole, triazole, triazine, imidazole or indole, a lower alkyl group substituted by a $C_3$–$C_7$ cycloalkyl radical, a lower alkyl group substituted by a phenyl, tolyl, xylyl, ethylphenyl, propylphenyl, isopropylphenyl, butylphenyl, isobutylphenyl, see-butylphenyl, tert-butylphenyl, or naphthyl radical, a lower alkyl group substituted by aciridine, oxetane, thiophene, furan, pyridine, azepine, isoxazole, thiazole, pyrimidine, diazepine, thiadiazole, triazole, triazine, imidazole or indole, or R and $R_1$ together form a polymethylene chain optionally interrupted by an oxygen, nitrogen or sulphur atoms, or $R_1$ represents, together with the C(R)-N< residue to which it is attached, the atoms required to complete a pyrrolidine, 4-hydroxypyrrolidine or pyrrolidone ring; and $R_2$ and $R_3$ may be the same or different and each can be hydrogen, lower alkyl lower alkyl substituted by halogen, hydroxy, lower alkoxy, mercapto, carboxyl, S-substituted dithio groups, $—NR_4R_5$ wherein $R_4$ and $R_5$ can be the same or different and each is hydrogen, lower alkyl, guanidino or phenyl, or $R_4$ and $R_5$ together may form a polymethylene chain containing up to 6 carbon atoms which may be interrupted by oxygen or nitrogen, or phenoxy or phenoxy substituted by hydroxy or halogen, $C_3$–$C_7$ cycloalkyl, phenyl, phenyl substituted by lower alkyl, hydroxy, lower alkoxy or halogen, or lower alkyl substituted by a $C_3$–$C_7$ cycloalkyl radical, lower alkyl substituted by aziridine, oxetane, thiophene, furan, pyridine, azepine, isoxazole, thiazole, pyrimidine, diazepine, thiadiazole, thiazole, triazine, imidazole or indole,;

aziridine, oxetane, thiophene, furan, pyridine, azepine, isoxazole, thiazole, pyrimidine, diazepine, thiadiazole, triazole, triazine, imidazole or indole,;

or $R_2$ and $R_3$, independently, together with the >C(H)-N< residue to which each is attached, by each represent the atoms required to complete a pyrrolidine, 4-hydroxypyrrolidine or pyrrolidone ring; and n is 0, 1, 2 or 3; as well as the esters thereof with alcohols selected from the group consisting of lower alkyl alcohols, aralkyl alcohols, phenols, alkanoyloxymethanols, amino-lower alkanoyloxymethanols, 3-hydroxyphthalide and 5-indanol; salts of the compounds of formula I, with acids or bases; and all optical isomers thereof.

28. An antimicrobial composition comprising an effective amount of a compound of formula I, according to claim 1 together with a suitable carrier.

30. A method of combatting plant pathogenic bacteria and fungi which comprises applying to their habitat an effective amount of a compound of formula I according to claim 1.

---

**4,213,970**

## ANTIVIRAL COMPOSITIONS CONTAINING A TRANSFER-RIBONUCLEIC ACID

**Guy Dirheimer, Strasbourg, and Pierre Louisot, Lyons, both of France, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany**

**Filed Jun. 14, 1979, Ser. No. 48,671**

**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824411**

**Int. Cl.[2] A61K** *31/70, 31/665;* **C07H** *21/02*

**U.S. Cl. 424—180** **4 Claims**

1. An antiviral pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiviral amount of eukaryotic transfer-ribonucleic acid.

2. A composition of claim 1, where said transfer-ribonucleic acid is derived from yeast.

---

**4,213,971**

## 4-N, 2'-N AND 4,2'-Di-N-FORTIMICIN AK DERIVATIVES

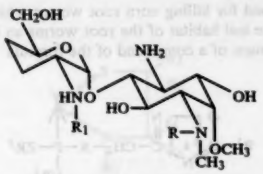
**James B. McAlpine, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed Mar. 29, 1979, Ser. No. 25,242**

**Int. Cl.[2] A61K** *31/71;* **C07H** *15/22*

**U.S. Cl. 424—181** **9 Claims**

1. A fortimicin AK derivative represented by the formula:



wherein: R and $R_1$ are the same or different members of the group consisiting of hydrogen, acyl, aminoacyl, diaminoacyl, N-lower-alkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, loweralkyl, aminoloweralkyl, diaminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, aminohydroxyloweralkyl, N,N-diloweralkylaminoloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl and the pharmaceutically acceptable salts thereof with the limitation that both R and $R_1$ cannot be hydrogen.

9. A pharmaceutical composition comprising an antibacterially effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,213,972

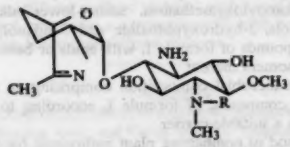
## 4-N, 2'-N AND 4,2'Di-N-FORTIMICINS AH AND AI

Jerry R. Martin, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

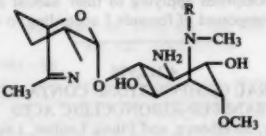
Filed Mar. 29, 1979, Ser. No. 25,254
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—181 14 Claims

1. 4-N,2'-N and 4,2'-Di-N-derivatives of fortimicins AI and AH represented by the formulae I and II respectively

I



II



wherein R is selected from the group consisting of acyl, aminoacyl, diaminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoloweralkyl, hydroxy-substituted aminoacyl, loweralkyl, hydroxyloweralkyl, aminoloweralkyl, diaminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, N-loweralkylaminohydroxyloweralkyl and N,N-diloweralkylaminohydroxyloweralkyl; and the pharmaceutically acceptable salts thereof.

14. A pharmaceutical composition comprising an anti-bacterially effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

---

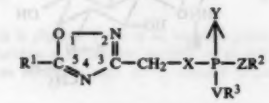
4,213,973

## USE OF OXADIAZOLE DERIVATIVES FOR CORN ROOT WORM CONTROL

Ronald E. Wheeler, Martinez, and William F. King, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 18, 1978, Ser. No. 943,079
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—200 2 Claims

1. A method for killing corn root worms which comprises adding to the soil habitat of the root worms an insecticidally effective amount of a compound of the formula



wherein $R^1$, $R^2$ and $R^3$ are $C_1$–$C_4$ alkyl; X and Y are sulfur; and Z and V are oxygen.

---

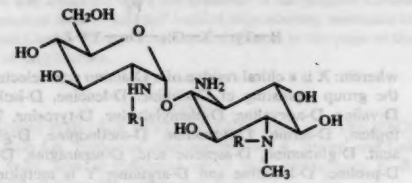
4,213,974

## 4-N, 2'-N AND 4,2'-Di-N-FORTIMICIN AO DERIVATIVES

Jerry R. Martin, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,249
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 12 Claims

1. Fortimicin AO derivatives represented by the formula:



wherein: R and $R_1$ are the same or different members of the group consisting of hydrogen, acyl, aminoacyl, diaminoacyl N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, loweralkyl, aminoloweralkyl, diaminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N,-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, and the pharmaceutically acceptable salts thereof with the limitation that R and $R_1$ each cannot be hydrogen.

8. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

---

4,213,975

## INSECTICIDAL SYNERGISTIC MIXTURES OF O,O-DIETHYL O-(3,5,6-TRICHLORO-2-PYRIDINYL)PHOSPHOROTHIOATE AND O-ETHYL O-(4-(METHYLTHIO)PHENYL)-S-N-PROPYL PHOSPHOROTHIOATE

Larry L. Larson, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 23, 1979, Ser. No. 23,516
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—200 7 Claims

1. A synergistic insecticidal composition which comprises an inert carrier and a mixture of toxicants consisting essentially of about 1 part by weight of O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl)-phosphorothioate and from about ¼ to about 8 parts by weight of O-ethyl O-(4-(methylthio)phenyl)-S-n-propyl phosphorothioate.

---

4,213,976

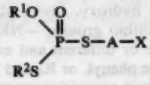
## HALOALKYLDITHIOPHOSPHORIC ACID ESTERS

Hans-Peter Loeffler, Ludwigshafen; Heinrich Adolphi, Limburgerhof, and Karl Kiehs, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,544
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743349
Int. Cl.[2] A01N *9/36*; C07F *9/165*
U.S. Cl. 424—224 7 Claims

1. A haloalkyldithiophosphoric acid ester of the formula I

I



where $R^1$ is methyl or ethyl, $R^2$ is alkyl of 2 to 4 carbon atoms, A is linear or branched alkylene of 2 to 4 carbon atoms and X is chlorine or bromine.

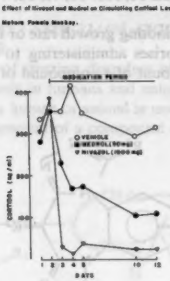
5. A process of pest control, wherein a haloalkyldithiophosphoric acid ester of the formula I is allowed to act on the pests or their habitat.

## 4,213,977

## PITUITARY-ADRENAL INHIBITING METHOD

Harry P. Schane, Jr.; Homer R. Harding, both of Canaan, and John E. Creange, Kinderhook, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 961,880
Int. Cl.[2] A61K *31/58*
U.S. Cl. 424—241 2 Claims



1. The method of suppressing pituitary-adrenal function without producing peripheral glucocorticoid effects in a person having an inappropriately high concentration of circulating corticoids and/or ACTH which comprises administering to the person an amount of (17α)-2'-(4-fluorophenyl)-2'H-pregna-2,4-dien-20-yno[3,2-c]pyrazol-17-ol effective in reducing the concentration of circulating corticoids and/or ACTH.

---

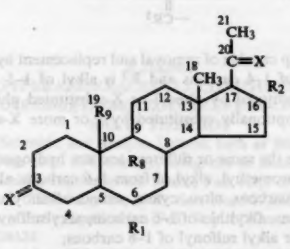
## 4,213,978

## ANTI-ACNE AND ANTI-SEBORRHEA PRODRUG DERIVATIVES OF PROGESTERONE

Nicholas S. Bodor, Lawrence, and Kenneth B. Sloan, Eudora, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

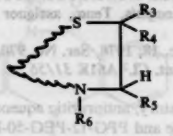
Continuation-in-part of Ser. No. 886,589, Mar. 14, 1978. This application Dec. 5, 1978, Ser. No. 966,585
Int. Cl.[2] A61K *31/58*; C07J *17/00*
U.S. Cl. 424—241 41 Claims

1. A method for topically treating acne or seborrhea on a subject afflicted with same which comprises topically administering thereto an anti-acne or anti-seborrhea effective amount of a compound having the formula



[I]

wherein each X is selected from the group consisting of 0 and



with the proviso that both X's cannot at the same time be 0, while either one or both can comprise the thiazolidine moiety;

$R_1$ is a member selected from the group consisting of H, $C_1$–$C_8$ alkyl and halogen;

$R_2$ is a member selected from the group consisting of H, OH, $OOCR_7$, halogen and $C_1$–$C_{10}$ alkyl;

$R_3$ and $R_4$ may be the same or different and each is selected from the group consisting of H and $C_1$–$C_8$ alkyl;

$R_5$ is —$COOR_7$;

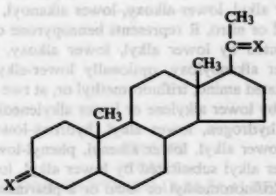
$R_6$ is a member selected from the group consisting of H, —$COR_7$, —$COOR_7$ and the pharmaceutically acceptable acid addition salts thereof;

$R_7$ is a member selected from the group consisting of H, $C_1$–$C_{20}$ alkyl, $C_2$–$C_{20}$ alkenyl, $C_5$–$C_7$ cycloalkyl, $C_5$–$C_7$ cycloalkyl-aryl, phenyl and $C_1$–$C_4$ alkyl substituted phenyl;

$R_8$ is a member selected from the group consisting of H, Cl and F; and

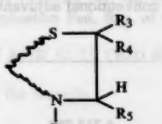
$R_9$ is a member selected from the group consisting of H and $C_1$–$C_8$ alkyl.

2. A method for topically treating acne or seborrhea on a subject afflicted with same which comprises topically administering thereto an anti-acne or anti-seborrhea effective amount of a compound having the formula



[II]

wherein each X is selected from the group consisting of 0 and



with the proviso that both X's cannot at the same time be 0, while either one or both can comprise the thiazolidine moiety;

$R_3$ and $R_4$ may be the same or different and each is selected from the group consisting of H and $C_1$–$C_8$ alkyl;

$R_5$ is —$COOR_7$;

$R_6$ is a member selected from the group consisting of H, —$COR_7$, —$COOR_7$ and the pharmaceutically acceptable acid addition salts thereof; and

$R_7$ is a member selected from the group consisting of H, $C_1$–$C_{20}$ alkyl, $C_2$–$C_{20}$ alkenyl, $C_5$–$C_7$ cycloalkyl, $C_5$–$C_7$ cycloalkyl-aryl, phenyl and $C_1$–$C_4$ alkyl substituted phenyl.

4,213,979

## STABLE SPRAYABLE HYDROCORTISONE PRODUCT

Donald J. Levine, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Dec. 18, 1978, Ser. No. 970,705
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 16 Claims

1. An anti-inflammatory, antipruritic aqueous solution comprising hydrocortisone and PPG-12-PEG-50-Lanolin.

---

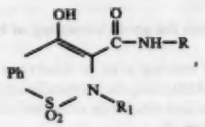
4,213,980

## AZATHIANAPHTHALENES

Alex Sele, Muttenz; Pier G. Ferrini; Georges Haas, both of Binningen; Knut A. Jaeggi, Basel, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 17, 1979, Ser. No. 4,113
Claims priority, application Switzerland, Jan. 30, 1978, 993/78
Int. Cl.[2] C07D *279/02;* A61K *31/54*
U.S. Cl. 424—246 10 Claims

1. A substituted 3,4-dihydro-2H-1,2-benzothiazine 1,1-dioxide of the formula



(I)

wherein Ph represents 1,2-phenylene or 1,2-phenylene substituted by lower alkyl, lower alkoxy, lower alkanoyl, halogen, trifluoromethyl or nitro, R represents benzopyrone or benzopyrone substituted by lower alkyl, lower alkoxy, halogen, hydroxy, lower alkanoyloxy, optionally lower-alkylated or lower-alkanoylated amino, trifluoromethyl or, at two adjacent carbon atoms, by lower alkylene or lower alkylenedioxy, and $R_1$ represents hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkenyl, phenyl-lower alkyl or phenyl-lower alkyl substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl or nitro or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical preparation containing an antiinflammatorically effective amount of a compound as claimed in claim 1 or a pharmaceutically acceptable salt thereof with a base, together with conventional adjuvants or carriers.

---

4,213,981

## INJECTABLE ANESTHETIC

Jon C. Wetzel, Plattsburgh, N.Y., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 787,643, Apr. 14, 1977, abandoned. This application Sep. 13, 1978, Ser. No. 941,999
Int. Cl.[3] A61K *31/415, 31/54*
U.S. Cl. 424—247 7 Claims

5. A method of inducing anesthesia in a mammal which comprises administering intravenously to said mammal an amount sufficient to produce a surgical plane of anesthesia of acepromazine, or a pharmaceutically acceptable salt thereof, and midaflur together or separately at approximately the same time, the ratio of midaflur to acepromazine being between about two hundred to one and about one to one.

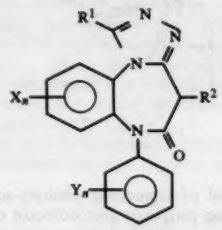
4,213,982

## NOVEL 4H-s-TRIAZOLO[4,3-a][1,5]BENZODIAZEPIN-5-ONES

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 778,823, Mar. 17, 1977, Pat. No. 4,133,809, which is a division of Ser. No. 365,012, May 29, 1973, abandoned. This application Sep. 21, 1978, Ser. No. 944,532
Int. Cl.[2] A61K *31/535, 31/41, 31/44, 445*
U.S. Cl. 424—248.52 7 Claims

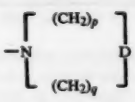
1. A method for promoting growth rate or feed efficiency in livestock which comprises administering to said livestock a growth promoting amount of a compound of the structure



wherein

$R^1$ is phenyl; X-substituted phenyl wherein X is as defined below; 2-, 3- or 4-pyridyl, cycloalkyl of 3–5 carbons;

$R^2$ is H; alkyl of 1–4 carbons optionally substituted by amino, mono-lower alkyl, di-lower alkyl amino, cyclic imines of formula



where D is methylene, oxygen or N-$R^{10}$ and where p and q are the same or different and are the integers 1, 2, and 3 provided that p+q is at least 1; hydroxy; alkoxy of 1–6 carbons or

wherein

is an acyl group capable of removal and replacement by hydrogen or alkyl of 1–4 carbons and $R^5$ is alkyl of 1–5 carbons optionally substituted by phenyl or X-substituted phenyl; or $R^5$ is phenyl optionally substituted by 1 or more X-substitutents;

X and Y are the same or different and are hydrogen, F, Cl, Br, trifluoromethyl, alkyl of from 1–6 carbons, alkoxy of from 1–6 carbons, nitro, cyano, amino, alkanoylamino of 1–4 carbons, alkylthio of 1–6 carbons, alkylsulfinyl of 1–6 carbons or alkyl sulfonyl of 1–6 carbons;

$R^{10}$ is hydrogen, alkyl of 1–4 carbons or phenyl optionally substituted by X, wherein X is as defined above; and

n is 0, 1 or 2.

4,213,983

## TREATING GASTRO-INTESTINAL DISORDERS AND EMESIS WITH N-(HETEROCYCLIC SUBSTITUTED) BENZAMIDES

Michael S. Hadley, Sawbridgeworth, and Eric A. Watts, Harlow, both of England, assignors to Beecham Group Limited, England

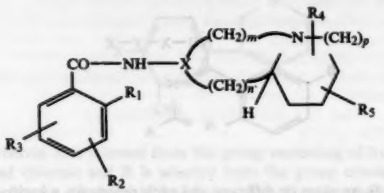
Filed Oct. 25, 1977, Ser. No. 845,027

Claims priority, application United Kingdom, Nov. 5, 1976, 46105/76

Int. Cl.[2] A61K *31/495;* C07D *471/04*

U.S. Cl. 424—250 116 Claims

81. A method of treating disorders of the gastro-intestinal function and emesis in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein

$R_1$ is alkoxy of 1 to 6 carbon atoms;

$R_2$ and $R_3$ are the same or different and are hydrogen, halogen, $CF_3$, hydroxy, alkoxy of 1 to 6 carbon atoms, alkanoyl of 2 to 7 carbon atoms, amino, amino substituted by one or two alkyl moieties of 1 to 6 carbon atoms, alkanoylamino of 2 to 7 carbon atoms, aminocarbonyl or aminosulphone unsubstituted or substituted by one or two alkyl moieties of 1 to 6 carbon atoms, alkylsulphone of 1 to 6 carbon atoms or nitro;

X is either a nitrogen atom, in which case m+n is 3 to 5, m is 2 to 4 and n is 1 to 3; or X is CH in which case m+n is 2 to 5, m is 1 to 5, and n is 0 to 4;

p is 0 to 3;

$R_4$ is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenyl-alkyl of 1 to 6 carbon atoms in the alkyl moiety, said phenyl or phenyl-alkyl being nuclear-unsubstituted or nuclear substituted by alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, $CF_3$ or halogen, and $R_5$ is hydrogen; or $R_4$ and $R_5$ are attached to two adjacent carbon atoms and form together with these two adjacent carbon atoms, a fused benzene ring, which benzene ring is unsubstituted or substituted by alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, $CF_3$ or halogen, in combination with a pharmaceutically acceptable carrier.

---

4,213,984

## 11-(PIPERAZINO-ACETYL)-5,11-DIHYDRO-6H-PYRIDO[2,3-b][1,4]BENZODIAZEPIN-6-ONES AND SALTS THEREOF

Günther Schmidt, and Matyas Leitold, both of Biberach an der Riss, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

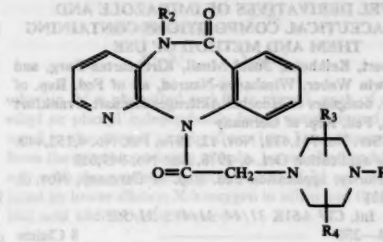
Filed May 19, 1978, Ser. No. 907,888

Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724434

Int. Cl.[2] A61K *31/55;* C07D *403/06*

U.S. Cl. 424—250 11 Claims

1. A compound of the formula



wherein

$R_1$ is alkyl of 3 to 12 carbon atoms; olefinic hydrocarbyl of 3 to 20 carbon atoms having 1 to 3 double bonds; methylenedioxy-benzyl; phenyl-(alkenyl of 2 to 4 carbon atoms); (cycloalkyl of 5 to 7 carbon atoms) - methyl; adamantylmethyl; or, when $R_3$ and/or $R_4$ are methyl or ethyl, also methyl or ethyl;

$R_2$ is hydrogen or methyl; and

$R_3$ and $R_4$ are each hydrogen, methyl or ethyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

11. The method of treating gastro-intestinal ulcers or inhibiting gastro-intestinal secretion in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anti-ulcerogenic or secretion-inhibiting amount of a compound of claim 1.

---

4,213,985

## NOVEL 5,11-DIHYDRO-6H-PYRIDO-[2,3-b][1,4]-BENZODIAZEPINE-6-ONES

Günther Schmidt, and Matyas Leitold, both of Biberach an der Riss, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

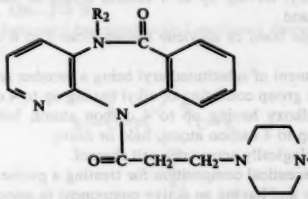
Filed May 19, 1978, Ser. No. 907,889

Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724501

Int. Cl.[2] A61K *31/55;* C02D *403/06*

U.S. Cl. 424—250 9 Claims

1. A compound of the formula



wherein $R_1$ is phenyl-(alkyl of 1 to 3 carbon atoms), and $R_2$ is hydrogen or methyl, or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,213,986

## NOVEL DERIVATIVES OF IMIDAZOLE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND METHOD OF USE

Ulrich Gebert, Kelkheim; Josef Musil, Kirchzarten-Burg, and Rolf-Ortwin Weber, Wiesbaden-Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

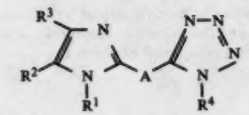
Division of Ser. No. 741,418, Nov. 12, 1976, Pat. No. 4,152,440. This application Oct. 6, 1978, Ser. No. 949,018

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650231

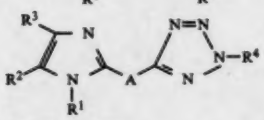
Int. Cl.[2] A61K *31/44, 31/495, 31/505*

U.S. Cl. 424—250 8 Claims

1. A physiologically-acceptable compound of one of the formulae



(I)



(II)

wherein

$R^1$ is a member selected from the group consisting of (a) a 6-membered heteroaromatic ring with up to two ring hetero atoms, each of which is a nitrogen atom, and (b) an alkyl group containing from 1 to 4 carbon atoms and substituted by such a heteroaromatic ring;

each of $R^2$ and $R^3$ is, independently, a hydrogen atom, alkyl having up to 4 carbon atoms, substituted or unsubstituted aryl or, together with the other of $R^2$ and $R^3$, unsubstituted —CH=CH—CH=CH— or —CH=CH—CH=CH— substituted by a member selected from the group consisting of alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms, haloalkyl having up to 4 carbon atoms, halo and nitro;

$R^4$ is a member selected from the group consisting of a hydrogen atom, alkyl having up to 4 carbon atoms, aryl and aralkyl having up to 4 carbon atoms in the alkyl moiety; and

A is a single bond or alkylene having from 1 to 6 carbon atoms;

any substitutent of substituted aryl being a member selected from the group consisting of alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms, haloalkyl having up to 4 carbon atoms, halo or nitro;

or a physiologically-acceptable salt thereof.

8. A phamaceutical composition for treating a purine metabolic disorder and having an active component in association with a pharmaceutical carrier or excipient, the active component comprising an antiuricopathic effective amount of a pharmacologically-acceptable compound according to claim 1 or of a physiologically-acceptable salt thereof.

4,213,987

## AGRICULTURAL FUNGICIDAL METHOD

Kazuto Nakagami; Shinji Yokoi, both of Yasumachi; Kenji Nishimura, Ube; Shigeki Nagai, Ube; Takeo Honda, Ube; Kiroku Oda, Ube; Katsutoshi Fujii, Ube; Ryuji Kobayashi, Ube, and Mikio Kojima, Ube, all of Japan, assignors to Sankyo Company Limited, Tokyo and Ube Industries, Ltd., Ube, both of, Japan

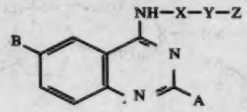
Filed May 30, 1978, Ser. No. 910,117

Claims priority, application Japan, Jun. 7, 1977, 52-67034

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—251 33 Claims

1. A method for protecting plants from fungicidal attack comprising applying to the site of said plants an agricultural fungicidal composition which contains as an active ingredient a fungicidally effective amount of a compound having the formula



wherein:

A and B are same or different and each represents a hydrogen atom, a lower alkyl group, a halogen atom or a nitro group;

X represents an alkylene group;

Y represents an oxygen atom or a sulfur atom; and

Z represents an alkyl group, an aralkyl group, a naphthyl group, an unsubstituted phenyl group or a phenyl group substituted with 1 to 3 substituents which are same or different and are selected from the group consisting of a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a phenyl group, a trifluoromethyl group and a halogen atom; or a salt thereof;

and an agriculturally acceptable carrier.

---

4,213,988

## INSECTICIDAL 1,5-BIS(α,α,α-TRIFLUORO-P-TOLYL)-1,4-PENTADIEN-3-ONE (1,4,5,6-TETRAHYDRO-2-PYRIMIDINYL)HYDRAZONES

James B. Lovell, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

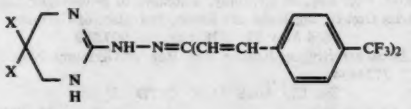
Division of Ser. No. 883,775, Mar. 6, 1978, Pat. No. 4,163,102, which is a continuation-in-part of Ser. No. 793,116, May 2, 1977, abandoned. This application Jan. 19, 1979, Ser. No. 4,645

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—251 5 Claims

1. A method for controlling fire ants and cockroaches comprising contacting the insects, their habitat, breeding grounds or feed with an insecticidally effective amount of a compound of the formula:



wherein X is hydrogen or methyl.

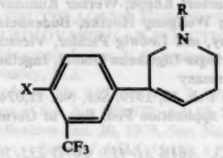
4,213,989

## ANOREXIGENIC 3-PHENYL-TETRAHYDROPYRIDINES

Lucien Nedelec, Le Raincy; Jacques Guillaume, Sevran, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 2, 1979, Ser. No. 9,234
Claims priority, application France, Feb. 8, 1978, 78 03526
Int. Cl.[2] A61K *31/44;* C07D *211/70*
U.S. Cl. 424—263 6 Claims

1. A method of curbing the appetite of warm-blooded animals comprising administering to warm-blooded animals an anorexigenically effective amount of at least one compound selected from the group consisting of 3-phenyl-tetrahydropyridines of the formula



wherein X is selected from the group consisting of hydrogen and chlorine and R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl and alkynyl of 3 to 5 carbon atoms and phenyl alkyl of 1 to 3 alkyl carbon atoms with the proviso that X is not hydrogen when R is benzyl and their non-toxic, pharmaceutically acceptable acid addition salts.

---

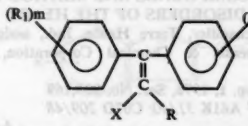
4,213,990

## 1,1-DIPHENYLETHENE DERIVATIVES AS MICROBICIDES

Willy Frick, Pfeffingen, and Adolf Hubele, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,994
Claims priority, application Switzerland, Mar. 17, 1978, 2931/78
Int. Cl.[2] A01N *9/22;* C07D *233/58, 249/08*
U.S. Cl. 424—269 15 Claims

1. A compound of the formula I



(I)

in which X is fluorine or chlorine; R is a 1,2,4-triazolyl-1 group or imidazolyl-1 group, each of which is unsubstituted or substituted by methyl; whilst $R_1$ and $R_2$ independently of one another are each a number, determined by m and n respectively, of identical or different substituents from the group: halogen, $C_1$–$C_3$-alkyl, $CF_3$ or —CN; and m and n independently of one another are each 0, 1, 2 or 3.

---

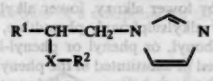
4,213,991

## DERIVATIVES OF SUBSTITUTED N-ALKYL IMIDAZOLES AND COMPOSITIONS AND METHODS CONTAINING THE SAME

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 30, 1978, Ser. No. 910,978
Int. Cl.[2] A01N *9/22;* A61K *31/415;* C07D *233/54*
U.S. Cl. 424—273 R 20 Claims

1. A compound of the formula



(I)

wherein $R^1$ is phenethyl and $R^2$ is phenyl, each of said phenethyl or phenyl independently being unsubstituted or substituted in the phenyl ring by from 1 to 3 substituents selected from the group consisting of halo, lower alkyl and lower alkoxy with the proviso that at least one of $R^1$ and $R^2$ be substituted by lower alkoxy; X is oxygen in sulfur and the antimicrobial acid addition salts thereof.

---

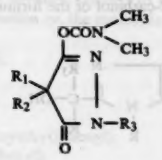
4,213,992

## INSECTICIDAL CARBAMATES

Heinrich Adolphi, Limburgerhof; Annegrit Baumann, Mannheim; Rolf Huber, Ludwigshafen; Karl Kiehs, Lampertheim, and Franz Merger, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 807,065, Jun. 16, 1977, abandoned.
This application Jul. 20, 1978, Ser. No. 926,405
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630912
Int. Cl.[2] A61K *31/415;* C07D *231/34*
U.S. Cl. 424—273 P 4 Claims

1. A carbamate of the formula



where $R_1$ and $R_2$ are identical or different and each is linear or branched alkyl of 1 to 4 carbon atoms or phenyl, and $R_3$ is linear or branched alkyl of 1 to 6 carbon atoms which is optionally substituted by phenyl or methoxy or is cycloalkyl of 3 to 6 carbon atoms, unsubstituted phenyl or phenyl bearing one or more halogen substituents.

4. A process for combatting pests, wherein the pests or the objects to be protected against pest attack are treated with an effective amount of a carbamate as claimed in claim 1.

---

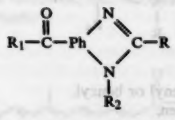
4,213,993

## ACYL-BENZIMIDAZOLE-2-METHANOL DERIVATIVES

Ernst Habicht, Oberwil; Pier G. Ferrini, Binningen, and Alfred Sallmann, Bottmingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 825,630, Aug. 18, 1977, Pat. No. 4,141,982.
This application Nov. 20, 1978, Ser. No. 962,426
Claims priority, application Luxembourg, Aug. 27, 1976, 75684
Int. Cl.[2] A61K *31/415;* C07D *235/12*
U.S. Cl. 424—273 B 10 Claims

1. A benz-acyl-benzimidazole-2-methanol derivative of the formula:



(I)

in which R is hydroxymethyl or etherified hydroxymethyl containing, as the etherified hydroxyl group, lower alkoxy, hydroxy-lower alkoxy, lower alkoxy-lower alkoxy or di-lower

alkylamino-lower alkoxy, $R_1$ is lower alkyl which is unsubstituted or substituted by lower alkoxy, lower alkylthio, lower alkylsulphinyl, lower alkylsulphonyl, phenylthio, phenylsulphinyl or phenylsulphonyl, or phenyl or phenyl-lower alkyl which are unsubstituted or substituted in the phenyl radical by lower alkyl, lower alkoxy or halogen, or is lower alkenyl or cycloalkyl having 3 to 8 carbon atoms, $R_2$ is hydrogen or lower alkyl and Ph is 1,2-phenylene which contains the radical of the formula $R_1$—C(=O)— and is otherwise unsubstituted or substituted by lower alkyl, lower alkoxy, hydroxyl halogen.

10. A pharmaceutical preparation containing an antiallergically effective amount of a compound as claimed in claim 1 together with a conventional pharmaceutical carrier.

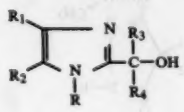
---

## 4,213,994
## IMIDAZOLYL-(2)-CARBINOLS HAVING HYPOLIPIDEMIC ACTION AND PROCESS FOR PREPARING THEM

**Ulrich Gebert, and Ernold Granzer, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Continuation of Ser. No. 351,523, Apr. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 318,110, Dec. 26, 1972, abandoned. This application Jan. 24, 1979, Ser. No. 6,203**
**Claims priority, application Fed. Rep. of Germany, Dec. 28, 1971, 2164919**
**Int. Cl.[2] A61K *31/415*; C07D *233/64, 235/12***
**U.S. Cl. 424—273 R** **25 Claims**

1. An imidazolyl-2-carbinol of the formula I(a)



I(a)

wherein

R=lower alkyl, phenyl or benzyl,

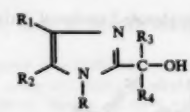
$R_1$ and $R_2$=hydrogen,

$R_3$=hydrogen, lower alkyl or phenyl,

$R_4$=lower haloalkyl, lower haloalkoxyphenyl, 1-benzylimidazol-2-yl, monohalophenyl, dihalophenyl or $R_3$ and $R_4$ are together fluoryl of the formula

all of said alkyl and alkoxy groups having 1 to 4 carbon atoms, and the physiologically tolerable acid addition salts.

22. A method for lowering the serum lipid level in the treatment of hyperlipidemia which comprises administering an effective amount of from 100 to 1000 mg per dosage unit of a compound of the formula I(a)



I(a)

wherein

R=lower alkyl, phenyl or benzyl,

$R_1$ and $R_2$=hydrogen,

$R_3$=hydrogen, lower alkyl or phenyl,

$R_4$=lower haloalkyl, lower haloalkoxyphenyl, 1-benzylimidazol-2-yl, monohalophenyl, dihalophenyl or $R_3$ and $R_4$ are together fluoryl of the formula

all of said alkyl and alkoxy groups having 1 to 4 carbon atoms, or of a physiologically tolerable acid addition salt thereof.

---

## 4,213,995
## 2-PHENYLIMINO-IMIDAZOLIDINES AND SALTS THEREOF

**Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, all of Fed. Rep. of Germany, and Ludwig Pichler, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany**

**Filed Feb. 12, 1979, Ser. No. 11,074**
**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806811**
**Int. Cl.[2] A61K *31/415*; C07D *233/50***
**U.S. Cl. 424—273 R** **3 Claims**

1. A compound of the formula

wherein R is 2,6-dichloro-4-hydroxymethyl-phenyl or tetrafluoro-phenyl; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of reducing the blood pressure of a warm-blooded animal in need thereof, which comprises enterally or parenterally administering to said animal an effective hypotensive amount of a compound of claim 1.

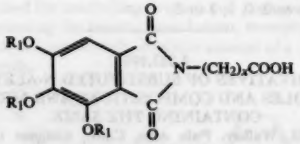
---

## 4,213,996
## PHTHALIMIDE COMPOUNDS AND METHOD FOR TREATING DISORDERS OF THE HEART

**Mohammed T. Shipchandler, Terre Haute, Ind., assignor to International Minerals & Chemical Corporation, Terre Haute, Ind.**

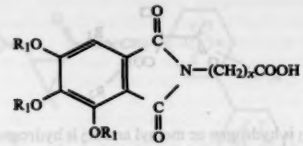
**Filed Sep. 1, 1978, Ser. No. 939,169**
**Int. Cl.[2] A61K *31/40*; C07D *209/48***
**U.S. Cl. 424—274** **4 Claims**

1. A method for the treatment or prophylaxis of cardiac disorders in a warm-blooded mammal which comprises the administration to said mammal of about 25 mg/kg of body weight to about 500 mg/kg per day of a compound of the formula



or a pharmaceutically-acceptable salt thereof, wherein x is an integer of from 1 to 10, and $R_1$ is selected from the group consisting of lower alkyl of from 1 to 5 carbon atoms.

4. A compound of the formula



or a pharmaceutically-acceptable salt thereof, wherein x is an integer of from 1 to 10, and $R_1$ is selected from the group consisting of lower alkyl of from 1 to 5 carbon atoms.

---

**4,213,997**

**THERAPEUTIC AGENT FOR IMPROVING CARDIOVASCULAR FUNCTION**

**John Westley, Mountain Lakes, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**Continuation of Ser. No. 647,850, Jan. 9, 1976, abandoned, which is a division of Ser. No. 489,978, Jul. 19, 1974, abandoned. This application Jan. 20, 1978, Ser. No. 871,042**

**Int. Cl.² A61K *31/35***

**U.S. Cl. 424—283** **2 Claims**

1. A pharmaceutical parenteral composition for producing myocardial stimulation in patients requiring such effects comprising an inert non-toxic pharmaceutically acceptable carrier base and, as the active ingredient, an amount which is effective in producing myocardial stimulation of lasalocid hexanoate, di-(N-methylglucamine) salt.

---

**4,213,998**

**INHIBITION OF LIPOGENESIS**

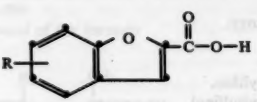
**Donald T. Witiak, Columbus, Ohio; John B. Carr, Houston, Tex., and Harry J. Mersmann, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 9,338, Feb. 5, 1979, abandoned, which is a continuation of Ser. No. 904,084, May 8, 1978, abandoned, which is a continuation of Ser. No. 811,647, Jun. 30, 1977, abandoned. This application Jun. 7, 1979, Ser. No. 46,592**

**Int. Cl.² A61K *31/34***

**U.S. Cl. 424—285** **1 Claim**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering to a mammal, orally or parenterally, an effective amount of a compound of the formula



wherein R is cycloalkyl of from three to six carbon atoms; alkyl or alkoxy of from one to eight carbon atoms; or is phenyl, phenoxy, benzyl or benzoyl or any of these substituted by one of alkyl or alkoxy of from one to six carbon atoms, fluorine, chlorine, bromine, nitro, acetyl, acetoxy and hydroxy, with the proviso that R also can be chlorine substituted at the 7-position of the molecule.

---

**4,213,999**

**INHIBITION OF LIPOGENESIS**

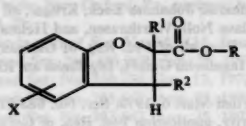
**Donald T. Witiak, Columbus, Ohio; John B. Carr, Houston, Tex., and Harry J. Mersmann, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 9,338, Feb. 5, 1979, abandoned, which is a continuation of Ser. No. 904,084, May 8, 1978, abandoned, which is a continuation of Ser. No. 811,647, Jun. 30, 1977, abandoned. This application Jun. 7, 1979, Ser. No. 46,593**

**Int. Cl.² A61K *31/34***

**U.S. Cl. 424—285** **1 Claim**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering to a mammal, orally or parenterally, an effective amount of a compound of the formula



wherein R is alkyl of from one to four carbon atoms or is 2-propenyl,

(a) $R^1$ and $R^2$ together represent a second bond between the two carbon atoms, and X is one of the following moieties, bonded to the carbon atom in the indicated position on the molecule:
(1) 5-benzyl;
(2) 5-(alkyloxy of from three to six carbon atoms;
(3) 4-phenoxy;
(4) 5-benzoyl;
(5) 5-(4-acetylphenyl);
(6) 5-(4-(acetyloxy)phenyl);
(7) 5-(4-(1-hydroxyethyl)phenyl);
(8)5-(4-acetamidophenyl);
(9) 5-(4-aminophenyl);
or

(b) $R^1$ and $R^2$ each represents a hydrogen atom, and X is one of the following moieties, bonded to the carbon atom in the indicated position on the molecule:
(1) 5-phenyl;
(2) 5-cyclohexyl;
(3) 5-benzyl;
(4) 6-phenoxy;
(5) 4-phenoxy;
(6) 5-(4(1-hydroxyethyl)phenyl);
(7) 5-(4-chlorophenyl);
(8) 5-(4-acetamidophenyl).

---

**4,214,000**

**ZINC SALT OF ALL-TRANS-RETINOIC ACID FOR THE TREATMENT OF ACNE**

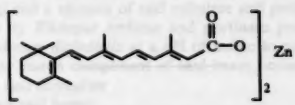
**Christopher M. Papa, Colts Neck, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Filed Oct. 30, 1978, Ser. No. 955,997**

**Int. Cl.² A61K *31/315*; C07F *3/06***

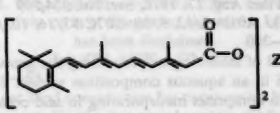
**U.S. Cl. 424—289** **29 Claims**

1. A zinc salt of all-trans-retinoic acid having the theoretical structural formula:



and a zinc content of about 7.1 to 8.5 weight percent.

2. A topical composition for the treatment of acne comprising a therapeutically effective concentration of a zinc salt of all-trans-retinoic acid in a pharmaceutically acceptable topical vehicle compatible therewith, said zinc salt having the theoretical structural formula:



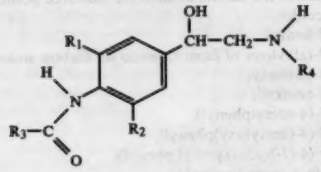
and a zinc content of about 7.1 to 8.5 weight percent.

## 4,214,001
## 1-(4-ACYLAMINO-PHENYL)-2-AMINO-ETHANOLS AND SALTS THEREOF

Günther Engelhardt; Johannes Keck; Krüger, all of Biberach an der Riss; Klaus Noll, Warthausen, and Helmut Pieper, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,814
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 2710997
Int. Cl.[2] A61K *31/27, 31/275;* C07C *121/80, 125/06*
U.S. Cl. 424—300 12 Claims

1. A compound of the formula



wherein

$R_1$ is hydrogen, halogen or cyano;

$R_2$ is fluorine, cyano, trifluoromethyl, nitro or alkyl of 1 to 4 carbon atoms;

$R_3$ is alkoxy of 1 to 5 carbon atoms, alkenyloxy of 2 to 5 carbon atoms, aryloxy of 6 to 10 carbon atoms, aralkoxy of 7 to 11 carbon atoms, or

$-NR_5R_6$, where $R_5$ and $R_6$ are each hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, aryl of 6 to 10 carbon atoms or aralkyl of 7 to 11 carbon atoms; and

$R_4$ is cycloalkyl of 3 to 5 carbon atoms or alkyl of 3 to 5 carbon atoms;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. A compound of claim 1 having bronchospasmolytic activity selected from the group consisting of:

1-(4'-ethoxycarbonylamino-3'-chloro-5'-fluoro-phenyl)-2-tert.butylamino ethanol;

1-(4'-ethoxycarbonylamino-3'-cyano-5'-fluoro-phenyl)-2-tert.butylamino ethanol;

1-(4'-ethoxycarbonylamino-3'-cyano-phenyl)-2-tert-.butylamino-ethanol;

1-(4'-ethoxycarbonylamino-3'3'-cyano-phenyl)-2-isopropylamino-ethanol

and their non-toxic, pharmacologically acceptable acid addition salts.

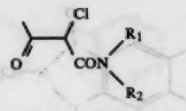
---

## 4,214,002
## PRESERVATION OF AQUEOUS SYSTEMS WITH 2-CHLORO-3-OXOBUTYRAMIDE DERIVATIVES

Harold A. Brandman, Glen Ridge; Milton Manowitz, Wayne, and David L. Coffen, Glen Ridge, all of N.J., assignors to Givaudan Corporation, Clifton and Hoffmann-La Roche Inc., Nutley, both of, N.J.

Filed Aug. 17, 1978, Ser. No. 934,309
Int. Cl.[2] A01N *9/12, 9/20;* C07C *97/16, 103/10*
U.S. Cl. 424—300 22 Claims

1. A method of inhibiting or preventing the growth of bacteria or fungi in an aqueous composition subject to spoilage thereby which comprises incorporating in said composition a bactericidally or fungicidally effective amount of a compound of the formula:



wherein $R_1$ is hydrogen or methyl and $R_2$ is hydrogen, methyl, acetyl, propionyl, butyroyl, carbomethoxy, carbethoxy, carbopropionoxy, or carbobutoxy.

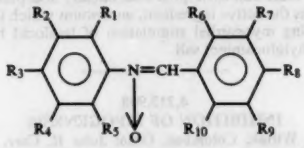
---

## 4,214,003
## METHOD OF TREATMENT

Henry F. Campbell, Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 839,961, Oct. 6, 1977, Pat. No. 4,153,722.
This application Oct. 3, 1978, Ser. No. 948,622
Int. Cl.[2] A61K *31/095, 31/255, 31/265, 31/275*
U.S. Cl. 424—301 16 Claims

1. A method of treating inflammation in warmblooded animals comprising the topical administration to said animals of an effective amount of a pharmaceutically active compound of the formula:



where:

$R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, $R_8$, $R_9$ and $R_{10}$ may be the same or different and are:

hydrogen,
alkyl,
cyano,
nitro,
amino,
haloloweraloxy,
halololoweralkyl,
halo,
loweralkoxy,
thio,
acylthio,
loweralkylthio,
loweralkylsulfinyl,
loweralkylsulfonyl and
hydroxy,

with the proviso that at least one $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$, $R_8$, $R_9$, and $R_{10}$ is selected from the group consisting of thio, acylthio, loweralkylthio, loweralkylsulfinyl or loweralkylsulfonyl.

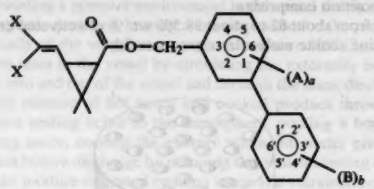
---

## 4,214,004
## INSECTICIDAL CYCLOPROPANECARBOXYLATES FROM SUBSTITUTED [1,1'-BIPHENYL]-3-YLMETHYL COMPOUNDS

Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 4, 1978, Ser. No. 966,405
The portion of the term of this patent subsequent to Dec. 21, 1995, has been disclaimed.
Int. Cl.[2] C07C *69/74;* A01N *9/30*
U.S. Cl. 424—305 17 Claims

1. A 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropanecarboxylate of the formula



wherein X is chloro or bromo, and
b is 0, a is 1-4, and
when a is 1,
A is 2-, 4- or 6-halo, 5-fluoro, 2-lower alkyl, 2 trifluoromethyl, and
when a is 2,
A is fluoro, 2 and 4-chloro, or 2 and 4-bromo, and
when a is 3 or 4,
A is fluoro;
or
a is 0, b is 1-5, and
when b is 1,
B is halo, 2' or 3'-lower alkyl, 2' or 3'-trifluoromethyl, or 2' or 3'-lower alkoxy, and
when b is 2,
B is fluoro, 2' and 4'-chloro, 2' and 4'-bromo, and
when b is 3, 4 or 5,
B is fluoro.

16. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of at least one compound of claim 1 in admixture with an agriculturally acceptable carrier.

---

**4,214,005**

## FUNGICIDAL ALKOXYALKOXYACETYL ACYLALANINES

**Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany; Adolf Hubele, Magden, and Walter Kunz, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

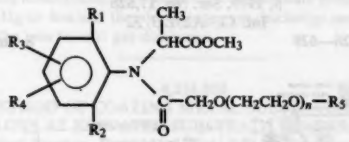
**Filed May 24, 1979, Ser. No. 41,847**

**Claims priority, application Switzerland, Jun. 2, 1978, 6076/78**

**Int. Cl.² A61K *31/24*; C07C *101/447***

**U.S. Cl. 424—309** **14 Claims**

1. A compound of the formula



(I)

wherein
$R_1$ represents $C_1$–$C_4$alkyl, $C_1$–$C_4$alkoxy or halogen,
$R_2$ represents $C_1$–$C_3$alkyl, $C_1$–$C_4$alkoxy or halogen,
$R_3$ represents hydrogen, $C_1$–$C_3$alkyl, $C_1$–$C_4$alkoxy or halogen,
$R_4$ represents hydrogen or methyl,
$R_5$ represents $C_1$–$C_4$alkyl or phenyl, and
n is 1, 2 or 3.

12. A fungicidal composition containing, as active component, a fungicidally effective amount of at least one compound according to claim 1 together with a suitable carrier therefor.

13. A method for controlling fungi, which comprises applying to said fungi or their environment a fungicidally effective amount of a compound according to claim 1.

**4,214,006**

## MOUTHWASH AND METHOD FOR PREVENTING AND REMOVING DENTAL PLAQUE

**Geraldine H. Thiele, New Oxford, Pa., assignor to Oxford Hill, Ltd., Oxford, Pa.**

**Continuation-in-part of Ser. No. 642,114, Dec. 18, 1975, abandoned, and Ser. No. 483,010, Jun. 25, 1974, Pat. No. 3,982,017, and Ser. No. 369,236, Jun. 12, 1973, Pat. No. 3,924,000, and Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, and Ser. No. 283,663, Aug. 25, 1972, Pat. No. 3,828,772, and Ser. No. 123,830, Mar. 12, 1971, Pat. No. 3,767,812, and Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204. This application Jul. 24, 1978, Ser. No. 927,614**

**The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.**

**Int. Cl.² A61K *31/20, 31/45***

**U.S. Cl. 424—318** **18 Claims**

1. The method of treating teeth for the removal of dental plaque and/or dental calculus from said teeth which comprises contacting said teeth with a sufficient and effective amount to achieve said purpose of a mouthwash which is a liquefied composition of a therapeutically effective amount of a non-necrotic fatty acid compound prepared from an unsubstituted, unsaturated fatty acid having at least one double bond, water, a buffering agent and ethanol, the pH of said liquefied composition being between 9 and 11.

---

**4,214,007**

## PROCESSED DRIED BEANS AS INSTANT FOOD AND THEIR MANUFACTURING METHOD

**Yoshinobu Hase; Masaaki Yamauchi, both of Osaka, and Ryozo Handa, Hirakata, all of Japan, assignors to Kanebo Foods, Ltd., Tokyo, Japan**

**Filed Jan. 16, 1978, Ser. No. 870,025**

**Int. Cl.² A23L *1/20***

**U.S. Cl. 426—44** **21 Claims**

5. A method for producing processed dried beans which are quickly restored to the condition of boiled soft raw beans by pouring hot water onto the processed dried beans, said beans being rich in starch and poor in both protein and fat,
the improvement comprising the successive steps of
(1) boiling raw beans at least once in water,
(2) subjecting said boiled beans to an enzymatic-treatment by contacting said boiled beans with an aqueous solution containing an enzyme acting on the pectic intercellular cellulosic materials of the bean cell walls, for a period of time sufficient to destroy the cellulosic substances or cellulosic and pectic substances of said cell tissues, said enzyme selected from the group consisting of cellulase produced by *Trichoderma viride* cellulase produced by *Irpex lacteus* and cellulase produced by *Trichoderma koningi* and a mixture of said cellulase and pectinase produced by *Rhizopus arrhizus* and pectinase produced by *Coniothrium diplodiella* at a pH of acidic to neutral such that the starch component of said beans becomes gelatinized, and thereafter
(3) drying said beans.

---

**4,214,008**

## LACTIC ACID FERMENTATE FLAVORED PET FOOD

**Richard L. Groben; Alfred J. Gryczka, and Alfred A. Franklin, all of Sarasota, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.**

**Continuation of Ser. No. 712,492, Aug. 9, 1976, Pat. No. 4,160,038. This application Mar. 14, 1979, Ser. No. 20,432**

**The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.**

**Int. Cl.² A23K *1/00, 1/10***

**U.S. Cl. 426—53** **10 Claims**

1. A dry pet food composition for carnivorous lower animals consisting essentially of a dry cereal protein pet food including an effective level of an antimycotic agent to prevent mold

formation, said composition being packageable under non-sterile conditions and containing less than about 15 percent by weight moisture, and further including a flavoring from a dried edible material fermentate of lactic acid producing bacteria in an amount sufficient to produce a pH from about 3 to less than 6 which flavored food is palatable to dogs and flavor stable, wherein the edible material fermentate is prepared by growing the bacteria in the presence of a meaty protein, vegetable protein or mixture thereof until lactic acid and the flavoring is produced and then by drying the fermentate which is then mixed with the cereal protein pet food.

---

**4,214,009**

## REPLACEMENT OF EGG ALBUMEN IN FOOD COMPOSITIONS

**Pei K. Chang, Montrose, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Aug. 7, 1978, Ser. No. 931,706**

**The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.**

**Int. Cl.[2] A23C *21/00***

**U.S. Cl. 426—558** **20 Claims**

1. A method for preparing egg albumen containing food products which comprises replacing at least a portion of the albumen requirement of said food product on a dry solids basis with a composition comprising a substantially non-heat denatured whey protein concentrate having at least 29% protein prepared substantially from acid cheese whey and from about 25% to 0% of another protein-containing whey-based product and 0.5% to 15% carboxymethylcellulose in such an amount that the total protein content provided by the whey protein concentrate and the egg albumen is no less than 38% below the protein content of the egg albumen on a dry basis originally present in the recipe.

---

**4,214,010**

## REPLACEMENT OF WHOLE EGG IN BAKED CUSTARD

**Constance R. Corbett, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Dec. 26, 1978, Ser. No. 973,507**

**Int. Cl.[2] A23J *3/02***

**U.S. Cl. 426—573** **17 Claims**

1. A method for preparing whole egg containing baked custard which comprises replacing up to about 75% of the whole egg requirement of said custard with an egg replacer composition comprising:

(a) from about 40% to about 60% of the composition of a blend of a whey solids product and from about 0.5% to about 5.0% based on the weight of the blend of carboxymethylcellulose, said whey solids product comprising:

(1) from about 75% to 100% of a substantially non-heat denatured whey protein concentrate having at least 35% protein wherein at least 50% of said protein is derived from acid whey, and

(2) from about 25% to 0% of another protein containing whey based product; and

(b) from about 60% to about 40% of the egg replacer composition of a lactylated shortening, said egg replacer composition replacing at least 90% of the whole egg solids replaced on a weight/weight basis, all percentages herein being on a dry weight basis.

---

**4,214,011**

## FIBER-REINFORCED, ACTIVATED, ZEOLITE MOLECULAR SIEVE TABLETS AND CARBONATION OF AQUEOUS BEVERAGES THEREWITH

**Herbert E. Strube, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

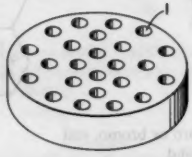
**Filed Dec. 7, 1978, Ser. No. 967,184**

**Int. Cl.[2] A23L *2/40*; B01J *29/04***

**U.S. Cl. 426—591** **28 Claims**

1. A composition of matter for preparing a non-fired, rigid composite, porous and activated zeolite molecular sieve material tablet for adsorbing and releasing adsorbable gases, said composition comprising:

(a) from about 82 to about 98.5% wt. % of activated crystalline zeolite molecular sieve material;



(b) from about 1 to about 15 wt. % of fibrous material selected from the group consisting of hydrophobic fibers and non-swelling hydrophilic fibers; and

(c) from about 0.5 to about 3 wt. % of tabletting lubricant; wherein said (a), (b) and (c) are uniformly mixed and tabletted into said rigid composite, porous and activated tablet.

---

**4,214,012**

## FAT COMPOSITIONS

**George E. Ainger, Wareham, and Brian L. Caverly, Meopham, both of England, assignors to Lever Brothers Company, New York, N.Y.**

**Continuation of Ser. No. 393,865, Sep. 4, 1973, abandoned, which is a continuation of Ser. No. 210,550, Dec. 21, 1971, abandoned. This application Nov. 4, 1977, Ser. No. 848,675**

**Claims priority, application United Kingdom, Jan. 6, 1971, 714/71**

**Int. Cl.[2] A23C *15/12***

**U.S. Cl. 426—607** **1 Claim**

1. A confectioner's butter having a slip melting point of between 28° and 40° C., a dilatation drop of at least 500 over the last 10° C. below the slip melting point, an Iodine Value of 10–25, and a fatty acid composition in random distribution of a blend consisting essentially of at least 88 wt % $C_{10}$–$C_{18}$ fatty acids including at most 15 wt % stearic acid, of 80–50 wt % lauric and 20–50 wt % edible non-lauric fats wherein the sum of palmitic and stearic acid content is 45 wt %.

---

**4,214,013**

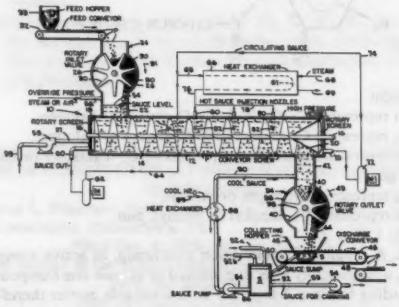
## CONTINUOUS PRESSURE COOKING METHOD

**Katsuji Hirahara, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.**

**Division of Ser. No. 804,115, Jun. 6, 1977. This application Mar. 5, 1979, Ser. No. 17,628**

**Int. Cl.[2] A23L *3/22***

**U.S. Cl. 426—629** **8 Claims**




1. A food processing method comprising the steps of substantially filling a vessel through a pressure sealing valve with

a mass of particulate raw food product such as beans, tomatoes, etc., creating a pressure environment in the vessel that is above atmospheric pressure, heating a canning sauce for the product externally of the vessel to a temperature above 100° C., cooking the mass in the vessel by circulating the externally heated sauce into and out of the vessel and through the mass; discharging the mixture of hot sauce and cooked product through a pressure sealing valve to the atmosphere; cooling a body of canning sauce, cooling the mixture while still under pressure and just before discharge by pumping the cooled canning sauce into the mixture of heated canning sauce and entrained cooked product under pressure to bring the temperature of the combined sauces low enough to cool the particulate product to a temperature which will prevent flashing at atmospheric pressure; and discharging the cooled sauce and the cooled, cooked entrained product therein from the pressure environment to atmosphere.

---

**4,214,014**

## METHOD FOR SURFACE TREATMENT OF CONTACT LENSES

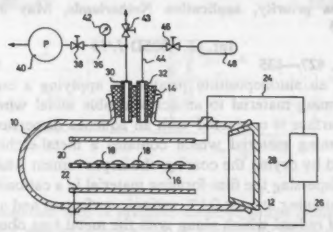
**Peter Höfer, Aschaffenburg, and Wolfgang Kohl, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to Titmus Eurocon Kontaklinsen GmbH & Co. KG, Aschaffenburg, Fed. Rep. of Germany**

**Filed Oct. 12, 1978, Ser. No. 950,894**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756114**

**Int. Cl.² G02B *1/12*; H01J *19/00***

**U.S. Cl. 427—40** **9 Claims**




1. Method for treating the surface of a hard or dehydrated hydrophilic contact lens, which method comprises introducing a lens which has been shaped and polished into a container, evacuating the container, flushing same with an oxygen-containing atmosphere, re-evacuating to an absolute pressure of 10 mm Hg or less and then initiating a gas discharge and subjecting the lens to said gas discharge.

---

**4,214,015**

## METHOD OF COATING METAL SUBSTRATES WITH ALLOYS AT ELEVATED SUBSTRATE TEMPERATURES

**Herbert Stephan, Bruchköbel, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Fed. Rep. of Germany**

**Filed Nov. 15, 1978, Ser. No. 960,896**

**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2820289**

**Int. Cl.² C23C *13/02***

**U.S. Cl. 427—42** **6 Claims**

1. Method for the vapor deposition of a coating of oxidation and corrosion inhibiting alloys including alloys from the group of CoCrAlY and NiCoCrAlY on metal substrates in a vacuum coating chamber at a substrate temperature above 500° C. which comprises interrupting the coating process temporarily at least once, allowing the substrates to cool by at least 30° C. and no more than 100° C., and before the beginning of or during the resumed coating process the substrate temperature that was present before cooling is substantially restored.

---

**4,214,016**

## PROCESS FOR MANUFACTURING PLASTIC ARTICLES HAVING ON THE SURFACE THEREOF A PROTECTED METAL FILM

**Katsuhide Manabe, Ichinomiya; Jiro Masumi, Aichi; Tomotada Tochitani, Ichinomiya, and Kenzo Shinoda, Gifu, all of Japan, assignors to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.), Aichi, Japan**

**Division of Ser. No. 700,117, Jun. 28, 1976, Pat. No. 4,104,432. This application Apr. 24, 1978, Ser. No. 898,796**

**Int. Cl.² B05D *3/06***

**U.S. Cl. 427—54.1** **8 Claims**

1. A process for manufacturing molded plastic articles having on the surface thereof a metal film coated with protective layers, characterized by (1) applying over said metal film a layer A consisting essentially of an acrylic copolymer of a lower alkyl ester of acrylic or methacrylic acid and a lower hydroxy-alkyl ester of acrylic or methacrylic acid and having a hydroxyl number of 10–150, and per 100 parts by weight of said copolymer 10–150 parts by weight of an anti-yellowing polyisocyanate and 2–10 parts by weight of an ultraviolet ray-absorbing agent and subjecting the mixture to heating to react the same; and then (2) while free hydroxyl groups are present in said layer A, applying over the heated layer A a layer B consisting essentially of an unsaturated polyester having terminal hydroxyl or carboxyl groups and about 10–80 parts by weight of an anti-yellowing polyisocyanate per 100 parts of said unsaturated polyester, which layer is curable by the action of ultraviolet rays and then curing the latter paint by irradiation of ultraviolet rays, or alternatively, reversing the order of said applying and corresponding curing steps A and B.

---

**4,214,017**

## PREPARATION OF PLATINUM-COATED SUBSTRATES

**Herbert A. Laitinen, and Joseph Rosenfarb, both of Gainesville, Fla., assignors to Board of Regents, State of Florida, for the use and benefit of the University of Florida, Tallahassee, Fla.**

**Filed Mar. 29, 1979, Ser. No. 25,117**

**Int. Cl.² C23C *3/00***

**U.S. Cl. 427—92** **4 Claims**

1. A process for coating a substrate with a thin layer of platinum which comprises immersing a substrate in a molten salt solution containing platinum ions or haloplatinum ions for a time sufficient to deposit a thin film of platinum on the outer surface of the substrate, removing the coated substrate from the solution, and washing away any removable salt, said substrate being an n-type semiconductor or a metal coated with a passivation film capable of preventing ions of said metal from entering said solution.

---

**4,214,018**

## METHOD FOR MAKING ADHERENT PINHOLE FREE ALUMINUM FILMS ON PYROELECTRIC AND/OR PIEZOELECTRIC SUBSTRATES

**Bernard Halon, New York, N.Y., and Dorothy M. Hoffman, Titusville, N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Aug. 14, 1978, Ser. No. 933,603**

**Int. Cl.² H04R *17/00*; B05D *5/12***

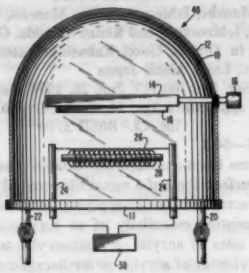
**U.S. Cl. 427—100** **10 Claims**

1. A method of forming an adherent pinhole free aluminum film on a substrate comprising:

heating an oxygen containing piezoelectric substrate to from about 150° C. to about 350° C. at a pressure of from about $1\times10^{-4}$ Torr to about $1\times10^{-6}$ Torr for a time sufficient to desorb any gas molecules on the surface of said substrate;

cooling said substrate with dry oxygen to about 125° C. with

a partial oxygen pressure of from about $1\times10^{-1}$ Torr to about $1\times10^{-4}$ Torr;



terminating the flow of oxygen and further reducing the pressure to about $1\times10^{-5}$ Torr or lower; and evaporating an aluminum film on said substrate.

---

**4,214,019**

**CAVITY FILLING WITH A HOT MELT ADHESIVE COMPOSITION**

**Donald D. Donermeyer, Springfield, and Joseph G. Martins, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 4, 1978, Ser. No. 948,380**
**Int. Cl.[2] B23P *7/04***
**U.S. Cl. 427—142** **20 Claims**

1. A method of filling a cavity in a substrate which comprises applying excess adhesive composition as a hot melt into the cavity, spreading the adhesive composition to fill the cavity, cooling the adhesive composition below its crystallization temperature and sanding the adhesive composition to provide a surface even with the surrounding substrate, wherein the adhesive composition comprises a block copolymer, aluminum powder, glass fiber and hollow inorganic silicate microspheres, wherein the block copolymer is selected from the group consisting of copolyesters, copolyamides, copoly(esteramides) and copoly(ether-esters) melting at a temperature of above about 150° C., having from about 30 to about 70 weight percent of hard segments and from about 70 to about 30 weight percent of soft segments; wherein the weight ratio of block copolymerto aluminum powder, glass fiber and silicate microspheres is in the range of about 3:7 to about 3:2, wherein the weight ratio of block copolymer to glass fiber is at least about 2:1, wherein the weight ratio of glass fiber to aluminum powder is at least about 1:9 and wherein the volume percentage of silicate microspheres is less than about 10.

---

**4,214,020**

**PROCESSES FOR COATING BUNDLES OF HOLLOW FIBER MEMBRANES**

**Robert R. Ward, Cary; Richard C. Chang, Raleigh; James C. Danos, Chapel Hill, and Joseph A. Carden, Jr., Durham, all of N.C., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Nov. 17, 1977, Ser. No. 852,277**
**Int. Cl.[2] B05D *3/00, 1/18, 3/02***
**U.S. Cl. 427—296** **32 Claims**

1. A process for coating the exteriors of hollow fibers assembled in the form of a bundle, which fibers, when coated, are suitable for fluid separations, comprising immersing the bundle of hollow fibers in a coating liquid containing material suitable for forming the coating and a sufficient amount of solvent to redissolve or resuspend any deposits on the hollow fibers of said material suitable for forming the coating which deposits are not retained on the hollow fibers; subjecting the hollow fibers to a pressure drop from the exterior to interior of the hollow fibers while the bundle is immersed in the coating liquid, said pressure drop being sufficient to provide a deposit of the material suitable for forming the coating on the hollow fibers; and removing the coating liquid from the bundle.

---

**4,214,021**

**COATING PROCESS FOR CORROSION-INHIBITING POLY(ARYLENE SULFIDE) COATING COMPOSITIONS**

**Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 832,503, Sep. 12, 1977, Pat. No. 4,145,326, which is a division of Ser. No. 346,834, Apr. 2, 1973, Pat. No. 4,064,084. This application Dec. 21, 1978, Ser. No. 972,083**
**Int. Cl.[2] B05D *3/02;* B32B *27/06***
**U.S. Cl. 427—385 R** **11 Claims**

1. A process for obtaining a smooth lightly colored cured coating of a poly(arylene sulfide) resin upon a substrate comprising forming a slurry comprising poly(arylene sulfide) resin, an inert liquid suspending agent, and about 0.5 to about 30 parts by weight of sodium nitrite per hundred parts by weight of poly(arylene sulfide) resin, coating the substrate with said slurry, and heating the coating under conditions sufficient to produce a cured coating.

---

**4,214,022**

**COATING METAL BY IMMERSION**

**Jan Kunnen, Noordwijkerhout, and Abraham C. Van Der Schee, Oegstgeest, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands**

**Continuation of Ser. No. 689,959, May 25, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,459**
**Claims priority, application Netherlands, May 30, 1975, 7506413**
**Int. Cl.[2] B05D *1/18***
**U.S. Cl. 427—435** **9 Claims**

1. In an autodeposition process of applying a coating of film-forming material to an acid-etchable metal wherein the metal surface is contacted with an aqueous dispersion of the film-forming material which contains a metal-etching acid, followed by drying the coating, the improvement which comprises dispersing the film-forming material in a cationic dispersion containing at least 0.1% cationic surfactant and a carboxylic acid radical which along with the metal ions obtained by etching the metal surface is capable of forming a negatively charged complex in the dispersion.

---

**4,214,023**

**ORNAMENTAL DEVICE**

**Nancy C. Day, 100 Morgan St., Roxboro, N.C. 27573**

**Filed Apr. 5, 1978, Ser. No. 894,355**
**Int. Cl.[2] A47G *33/08***
**U.S. Cl. 428—11** **1 Claim**

1. An ornamental device comprising three identical, normally planar, flexible panels, each of the panels being completely solid and imperforate with its perimeter being continuous and uninterrupted, means securing substantially one-half of adjacent peripheral edges of two of the panels together while leaving the remainder of the panels unattached, and means

securing substantially all of the periphery of the third panel to the unattached one-half peripheral edge portions of the first two panels while leaving the remainder of the third panel unattached to provide a three-dimensional ornamental device having a hollow central body area and radially extending peripheral edge portions disposed in three different radial planes with the panels being connected together only at their peripheral edges with the central body area of the panels being free of each other, each of said panels being in the form of a five pointed, two-dimensional star forming a seven pointed three-dimensional star when assembled with only the peripheral edges of the star points being connected, each of said panels being constructed of flexible fabric material such as felt and the means for securing the peripheral edges of the panels together is in the form of stitching thereby forming a self-sustaining but flexible ornamental device in which the central areas of the panels may be removed apart, the bottom central area of the central body defined by the stitching including an aperture formed by interrrupting the stitching along a lower central peripheral portion of the panels for a short distance for reception of a Christmas tree trunk, branch, or the like, to enable the ornamental device to be used as the top ornament or other ornament on a Christmas tree.

---

**4,214,024**

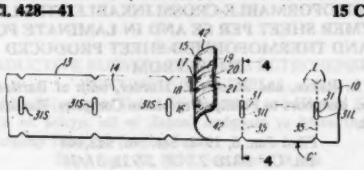
## COMPOSITE LABEL WEB AND METHOD OF MAKING SAME

**David N. Jacobson, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio**

**Filed Sep. 9, 1977, Ser. No. 832,033**

**Int. Cl.² B32B *3/10*; G09F *3/00*; A44C *3/00*; B32B *31/00***

**U.S. Cl. 428—41** **15 Claims**



**1.** A composite web of pressure sensitive labels, comprising: a composite web including a web of supporting material and a web of label material having a patterned coating of pressure sensitive adhesive releasably securing the label material to the supporting material web, longitudinally spaced, lateral cuts dividing the label material into a series of labels, the adhesive being disposed along two laterally spaced, relatively wide, longitudinally extending zones and a relatively narrow, longitudinally extending intervening zone, a longitudinally extending adhesive-free zone between each relatively wide adhesive zone and the relatively narrow adhesive zone, the thicknesses of the relatively wide and narrow adhesive zones being substantially the same, and longitudinally spaced feed holes disposed at the lateral cuts and extending through the composite web and through the relatively narrow adhesive zone and the adhesive-free zones on the label material without extending into the relatively wide adhesive zones on the label material.

---

**4,214,025**

## MESH ELECTRODES AND METHOD OF MAKING THEM

**Ralph D. Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England**

**Filed Aug. 22, 1977, Ser. No. 826,956**

**Claims priority, application United Kingdom, Aug. 25, 1976, 35414/76**

**Int. Cl.² H01J *1/46***

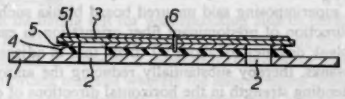
**U.S. Cl. 428—67** **12 Claims**

**1.** A method of making a mesh electrode including the steps of applying a first coat of settable refractory compound to one surface of a supporting plate having a plurality of apertures therein; firing said first coat to harden it and render it subsequently unmeltable; applying a second coat of settable refractory compound when the first coat is hard; pressing a sheet of mesh material into the second coat to bridge the apertures in the supporting plate; and firing the second coat to harden it and render it unmeltable so that said mesh material is retained in position substantially parallel to the supporting plate when the second coat is hard.

**12.** The method of making a segmented mesh electrode, which comprises the steps of:

(a) providing a metallic support plate with a pattern of apertures;

(b) forming a first coating of electrically insulating refrac-



tory material on one surface of said support plate, said first coating being fired and incapable of being subsequently melted and adhered to said one surface to define a refractory material supporting surface;

(c) forming a layer of refractory material on said refractory material supporting surface;

(d) pressing a sheet of mesh material into said layer of refractory material while firing same, thereby to form a second coating of unmeltable electrically insulating refractory material and adhere it with said mesh embedded therein to said first coat; and then

(e) cutting through said second coating and said mesh to separate said mesh into individual segments overlying respective apertures of said pattern.

---

**4,214,026**

## SHEET MOLDING MATERIAL

**Jyoji Ibata, Fuji; Hisaaki Fukui, Nobeoka; Takeo Yuasa, and Michio Katoh, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 24, 1978, Ser. No. 936,551**

**Int. Cl.² B32B *13/12, 27/36, 27/38***

**U.S. Cl. 428—67** **43 Claims**

**1.** A sheet molding material comprising (1) an interlayer containing a photopolymerizable resin and a photocuring agent for the photopolymerizable resin and (2) a surface layer of a thermosetting resin containing a heat curing agent for the thermosetting resin on both surfaces of the interlayer (1).

---

**4,214,027**

## PROCESS FOR THE PRODUCTION OF FIBER-CONTAINING PLASTER BOARDS

**Alfons Knauf, Saar; Jorg Bold, Kaiserslautern, and Siegfried Franke, Ochsenfurt, all of Fed. Rep. of Germany, assignors to Gebr. Knauf Westdeutsche Gipswerke, Iphofen, Fed. Rep. of Germany**

**Continuation of Ser. No. 782,716, Mar. 29, 1977, abandoned. This application Mar. 27, 1979, Ser. No. 24,336**

**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2613976**

**Int. Cl.² B32B *5/12, 3/18, 31/14***

**U.S. Cl. 428—113** **17 Claims**

**1.** A monolithic, fiber-reinforced board which is sufficiently thick to be suitable for use as a floor element, which board comprises a plurality of layers each of which contains substantially homogeneously distributed reinforcing fibers and calcium sulfate binder, wherein the reinforcing fibers in each said layer are oriented predominantly in one direction, and wherein the direction of predominant fiber orientation in each layer deviates by about 90° from that in adjacent layers, said plural-

ity of layers being molded together under pressure prior to the setting of the calcium sulfate binder to consolidate said layers into a monolithic, fiber-reinforced board.

5. In a process for producing a monolithic, fiber-reinforced board which is sufficiently thick to be suitable for use as a floor element, which process comprises the steps of superimposing a plurality of fiber-reinforced board blanks, molding and drying; the improvement which comprises:

(a) using as said plurality of board blanks uncured board blanks containing substantially homogeneously distributed reinforcing fibers, calcium sulfate binder and a quantity of water in excess of the quantity necessary for setting said binder, wherein the reinforcing fibers of each board blank are oriented predominantly in one direction;

(b) superimposing said uncured board blanks such that the direction of predominant fiber orientation in each board blank deviates by about 90° from that in adjacent board blanks, thereby substantially reducing the anisotropy of bending strength in the horizontal directions of extension in the molded product of step (c); and

(c) molding the resultant superimposed board blanks under sufficient pressure prior to the setting of said calcium sulfate binder contained in said board blanks to form a monolithic fiber-reinforced board;

whereby the steps of setting and drying the individual board blanks and then gluing together the resultant cured blanks are avoided.

---

**4,214,028**

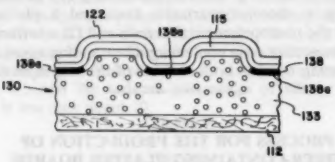
## RESINOUS POLYMER SHEET MATERIALS HAVING SURFACE DECORATIVE EFFECTS AND METHODS OF MAKING THE SAME

**Harry A. Shortway, Franklin Lakes; Alan A. Graham, Mercerville, and Charles H. Miller, Lawrenceville, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.**

**Continuation-in-part of Ser. No. 879,171, Feb. 21, 1978, abandoned, and Ser. No. 942,246, Sep. 14, 1978, abandoned. This application Jan. 22, 1979, Ser. No. 5,277**

**Int. Cl.² B32B** *5/20, 31/22, 31/26*

**U.S. Cl. 428—159** **27 Claims**




1. A resinous polymer sheet material having substantially uniformly polymerized, cross-linked and thermoset mechanically embossed flat, dead or dull mat texture finish decorative effects over substantially its entire surface comprising:

a base layer or substrate;

a printing ink composition layer forming a pattern or design on said base layer or substrate; and

a resinous polymer wear layer on said printing ink composition layer comprising substantially uniformly therein polymerized, cross-linked and thermoset reactive polymerizable and cross-linkable monomeric materials and having mechanically embossed flat, dead or dull mat texture finish decorative effects over substantially its entire surface, which mechanically embossed flat, dead or dull mat texture finish decorative effects possess increased resistence to softening, melting or flowing due to subsequent increases in ambient temperatures.

**4,214,029**

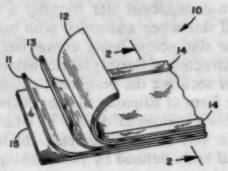
## PACKAGING LAMINATE

**Donald E. Barnes, Minnetonka, Minn., assignor to Champion International Corporation, Stamford, Conn.**

**Filed Oct. 30, 1978, Ser. No. 955,888**

**Int. Cl.² B32B** *7/10, 15/02*

**U.S. Cl. 428—200** **2 Claims**




1. A unitary packaging laminate consisting essentially of a foil substrate, a polypropylene outer layer, an intermediate layer of polyethylene or ethylene-acrylic acid copolymer located between and adhered to said substrate and said outer layer, a printed adhesive pattern of low temperature heat sealable material on the exterior surface of said outer layer, and a coating of low temperature heat sealable material on the inner surface of said substrate.

---

**4,214,030**

## THERMOFORMABLE-CROSSLINKABLE ETHYLENE POLYMER SHEET PER SE AND IN LAMINATE FORM AND THERMOFORMED SHEET PRODUCED THEREFROM

**James L. Rakes, and Joseph R. Harder, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 6, 1978, Ser. No. 913,148**

**Int. Cl.² B32B** *27/08, 27/32, 31/26*

**U.S. Cl. 428—212** **33 Claims**

1. A sheet of a crosslinkable polymer of ethylene supported by a sheet of a support polymer where said crosslinkable polymer of ethylene is selected from a group consisting of ethylene homopolymers, copolymers of ethylene and at least one acyclic mono-1-olefin hydrocarbon having 3 to 8 carbon atoms per molecule, and mixtures of any two or more thereof, said crosslinkable polymer of ethylene having incorporated therein a suitable crosslinking agent and where said support polymer has a melt index which is sufficiently low to prevent said support polymer from being deformed when said support polymer is heated to a temperature suitable for crosslinking said crosslinkable polymer of ethylene.

8. A thermoformed article produced from a composite sheet having at least first and second layers, said first layer comprising a crosslinked polymer of ethylene selected from a group consisting of ethylene homopolymers, copolymers of ethylene and at least one acyclic mono-1-olefin hydrocarbon having 3 to 8 carbon atoms per molecule, and mixtures of any two or more thereof, said second layer comprising a support polymer having a melt index which is sufficiently low to prevent said support polymer from being deformed when said support polymer is heated to the temperature required to crosslink the crosslinkable polymer of ethylene from which said crosslinked polymer of ethylene was formed.

14. A method for producing a sheet of a crosslinkable polymer of ethylene where said crosslinkable polymer of ethylene is selected from a group consisting of ethylene homopolymers, copolymers of ethylene and at least one acyclic mono-1-olefin hydrocarbon having 3 to 8 carbon atoms per molecule, and mixtures of any two or more thereof, said crosslinkable polymer of ethylene having incorporated therein a suitable crosslinking agent, comprising the steps of:

extruding a sheet of said crosslinkable polymer of ethylene; and

supporting the sheet of said crosslinkable polymer of ethylene on a sheet of a support polymer where said support polymer has a melt index which is sufficiently low to prevent said support polymer from being deformed when said support polymer is heated to a temperature suitable for crosslinking said crosslinkable polymer of ethylene.

23. A method of thermoforming a sheet of a crosslinkable polymer of ethylene where said crosslinkable polymer of ethylene is selected from the group consisting of ethylene homopolymers, copolymers of ethylene and at least one acyclic mono-1-olefin hydrocarbon having 3 to 8 carbon atoms per molecule, and mixtures of any two or more thereof, said crosslinkable polymer of ethylene having incorporated therein a suitable crosslinking agent, comprising the steps of:

supporting said sheet of a crosslinkable polymer of ethylene on a sheet of a support polymer, to thereby form a composite sheet where said support polymer has a melt index which is sufficiently low to prevent said support polymer from being deformed when said support polymer is heated to a temperature suitable for crosslinking said crosslinkable polymer of ethylene;

heating said composite sheet to a temperature sufficient to produce significant crosslinking of said crosslinkable polymer of ethylene, said temperature also being suitable to soften the sheet of said crosslinkable polymer of ethylene and the sheet of said support polymer to the extent necessary for the thermoforming process; and

thermoforming said composite sheet to produce a desired product.

---

**4,214,031**

## CONDUCTIVE SUBSTRATE FOR ELECTROSENSITIVE RECORDING MATERIAL

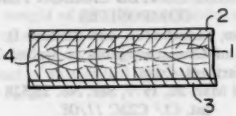
**Nobuhiro Miyakawa, Kobe; Eiichi Inoue, and Hiroshi Kokado, both of Tokyo, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan**

**Filed Apr. 22, 1976, Ser. No. 679,358**

**Claims priority, application Japan, Apr. 28, 1975, 50-50691**

**Int. Cl.² B32B 7/02, 7/10**

**U.S. Cl. 428—213** **16 Claims**




1. An electroconductive substrate for an electrically responsive recording material comprising a porous substrate and a layer of at least one electric conductor selected from the group consisting of cationic conductors and anionic conductors, said conductor layer being formed in the porous substrate along the entire thickness direction thereof extending from one surface of said porous substrate to the other surface of said porous substrate, wherein said conductor layer has a three layer distribution structure comprising (a) a layer of a cationic electroconductive resin distributed predominantly in the one surface portion of the porous substrate, (b) a layer of an anionic electroconductive resin distributed predominantly in the other surface portion of the porous substrate, and (c) a layer of a polysalt of the cationic electroconductive resin and the anionic electroconductive resin interposed between both the electroconductive resin layers (a) and (b) in such a positional relationship that the polysalt layer (c) is adjacent to said electroconductive resin layers (a) and (b), wherein said three layer distribution structure is formed by impregnating one surface of the porous substrate with the cationic electroconductive resin and impregnating the other surface of the porous substrate with the anionic electroconductive resin.



**4,214,032**

## INSULATING FELTS REINFORCED BY FIBROUS MATERIALS PARTICULARLY FOR THE WATERPROOFING AND/OR CORROSION-PROOFING OF METAL AND/OR CONCRETE OBJECTS

**Rezsö Csikós, Andra's Balogh, both of Veszprém, Jozsef Herendi, Balatonal madi, Peter L. Farkas, Veszprém, János Reményi, Veszprém, Sándor Koltary, Veszprém, all of Hungary, assignors to Magyar Ásványolaj és Földgáz Kisérleti Intézet, Veszprém, Hungary**

**Filed May 16, 1977, Ser. No. 796,885**

**Claims priority, application Hungary, May 19, 1976, MA 2775**

**Int. Cl.² B32B 11/02, 11/10; D06N 5/00**

**U.S. Cl. 428—280** **6 Claims**

1. In an insulating felt for waterproofing and/or corrosion-proofing metal and concrete objects, said insulating felt comprising asphalt, a softener, a plasticizer, fine-grained material and a reinforcing material wherein the improvement comprises the felt additionally contains a pyrolytic resin, the pyrolytic resin and the asphalt when admixed in liquid phase, at a temperature over the softening point, producing a homogeneous mixture of the asphalt and the pyrolytic resin, said pyrolytic resin being present in an amount by weight of 23 to 39% , said asphalt being present in an amount of from 35 to 54% by weight, said softener being present in an amount of from 4 to 7% by weight, said plasticizer being present in an amount of from 2.5 to 8% by weight, said fine-grained material being present in an amount of from 2 to 4% by weight and said reinforcing material being present in an amount of from 10 to 25% by weight.

---

**4,214,033**

## NOVEL MESH FABRIC AND WIG AND HAIR-PIECE MADE THEREFROM

**John D. Clifton, 50 Elgin Crescent, London W 11, England, and Victor W. Titow, Stoke Poges, England, assignors to John David Clifton, London, England**

**Filed Oct. 14, 1977, Ser. No. 842,328**

**Claims priority, application United Kingdom, Oct. 18, 1976, 43129/76; Apr. 12, 1977, 14987/77**

**Int. Cl.² D03D 9/00**

**U.S. Cl. 428—255** **5 Claims**

1. A novel mesh fabric formed from filaments of a synthetic material having a mean diameter of not greater than 0.11 mm, a breaking load of not less than 0.45 lbs, and a stiffness of at least 3:1 as determined by the loop test, the fabric having a stable mesh structure, a mesh size equal to at least twice the size of the mean diameter of the filament and a bursting strength of not less than 20 p.s.i.

---

**4,214,034**

## AGRICULTURAL COVERING MULTILAYER FILM OR SHEET STRUCTURE AND METHOD FOR THERMAL INSULATION

**Yoshiaki Kodera, Kusatsu; Kiyoyuki Watanabe, Jyoyo; Tetsuo Kadoya, Osaka, and Tadashi Taguchi, Kyoto, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Jun. 1, 1978, Ser. No. 911,955**

**Int. Cl.² B32B 5/18, 27/42**

**U.S. Cl. 428—315** **4 Claims**

1. A covering multilayer film or sheet structure for agricultural application, which consists essentially of:

(1) a film or sheet of a resin composition comprising (A) 100 parts by weight of a thermoplastic resin selected from the group consisting of polyethylene, ethylene/vinyl acetate copolymer, mixtures thereof, and vinyl chloride resins and (B) about 1 to about 40 parts by weight of an acetal resin having a degree of polymerization of about 500 to about 3,500 and selected from the group consisting of polyoxy-

methylene polymer and polyoxymethylene copolymer containing up to about 3% by weight of a comonomer, and

(2) a layer of the thermoplastic resin (A) laminated to at least one surface of the film or sheet (1).

---

4,214,035

## ANTISTATIC COATED POLYESTER FILM

John M. Heberger, Greenville, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 1,328, Jan. 5, 1979, abandoned. This application Jan. 31, 1979, Ser. No. 8,012

Int. Cl.[2] B32B *27/08, 27/30, 27/36*

U.S. Cl. 428—340 20 Claims

1. A biaxially oriented polyester film comprising a polyester film support coated on one side with a latex coating, said coating including:

stearamidopropyldimethyl-$\beta$-hydroxy-ethylammonium nitrate, present in a concentration in the range of between 2.75% and 3.25% by weight, based on the total weight of the latex coating; and

a crosslinkable methylmethacrylate-ethyl acrylate-methacrylamide terpolymer, having a glass transition temperature in the range of between about 40° C. and 50° C., present in a concentration in the range of between about 0.75% and 1.25% by weight based on the total weight of the latex coating wherein the weight ratio of said stearamidopropyldimethyl-$\beta$-hydroxy-ethylammonium nitrate to said crosslinkable methylmethacrylate-ethyl acrylate-methacrylamide terpolymer is in the range of between about 2.75:1 and 3.25:1.

12. A film in accordance with claim 1 wherein opposite said latex coating is coated with a second latex coating, said second latex coating comprising a crosslinkable methylmethacrylate-ethylacrylate-methacrylamide terpolymer having a glass transition temperature in the range of between about 40° C. and 50° C., and present in a concentration of between about 3.0% and 4.0% by weight, based on the total weight of said second latex coating.

13. A process for forming an antistatic biaxially oriented polyester film comprising the steps of:

applying a latex coating, said coating comprising stearamidopropyldimethyl-$\beta$-hydroxy-ethylammonium nitrate, present in a concentration in the range of between about 2.75% and 3.25% by weight, based on the total weight of said latex coating, and a crosslinkable methylmethacrylate-ethylacrylate-methacrylamide terpolymer having a glass transition temperature in the range of between about 40° C. and 50° C. and present in a concentration in the range of between about 0.75% and 1.25% by weight based on the total weight of the latex coating wherein the weight ratio of said nitrate to said terpolymer is in the range of between about 2.75:1 and 3.25:1, to a uniaxially drawn polyester film;

heating said coated, uniaxially drawn film at a temperature in the range of between about 90° C. and 110° C. wherein said coating is dried;

stretching said coated uniaxially drawn film in a direction normal to the direction of the uniaxially drawn film wherein biaxially drawn film is produced.

19. A process in accordance with claim 13 wherein said uniaxially drawn film is coated with a second coating on the side opposite said first coated side, said second coating comprising a latex coating including a crosslinkable methylmethacrylate-ethyl acrylate-methacrylamide terpolymer having a glass transition temperature in the range of between about 40° C. and 50° C., present in a concentration in the range of between 3.0% and 4.0% by weight, based on the total weight of said second latex coating.

4,214,036

## CHANNEL-SHAPED SEALING, TRIMMING AND GUIDING STRIPS

Robert G. Bright, Viersen, Fed. Rep. of Germany, assignor to Draftex Development AG, Switzerland

Filed Sep. 5, 1978, Ser. No. 939,655

Int. Cl.[2] B32B *3/26;* E06B *7/16, 7/23*

U.S. Cl. 428—358 10 Claims

1. A channel-shaped sealing, trimming or finishing, or guiding strip, comprising

channel-shaped flexible covering material, and

a carrier completely embedded in the flexible material,

the flexible covering material and the carrier forming a closed loop,

relatively stiff and substantially incompressible lengths of the carrier alternating along the length of the strip with relatively flexible and compressible lengths of the carrier,

the relatively flexible and compressible lengths of the carrier being positioned at predetermined places where bends in the strip are required in use.

9. A channel-shaped sealing, trimming or finishing strip for embracing and fitting onto a flange surrounding a predetermined opening, comprising

a length of channel-shaped metal carrier connected to itself to form a closed loop sized to match the length of the flange, the carrier comprising a series of U-shaped elements and relatively flexible connecting links connecting each element to the two adjacent elements,

the U-shaped elements which form part of the carrier in regions between those parts of the said loop which are required to accommodate bends in the flange being additionally connected together by relatively inflexible connecting links which make the carrier relatively stiffer and less compressible over those regions than at the parts which are required to accommodate the bends in the flange, and

flexible channel-shaped covering material in which the metal carrier is completely embedded.

---

4,214,037

## SILICON NITRIDE COATED CARBON FIBERS AND COMPOSITES

Francis S. Galasso, Manchester, and Richard D. Veltri, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1979, Ser. No. 25,528

Int. Cl.[2] C23C *11/08*

U.S. Cl. 428—367 3 Claims

1. A non-conductive fiber which comprises: a carbon fiber having a thin adherent coating of silicon nitride, said coating having a thickness of from about 0.05 to about 2 microns.

---

4,214,038

## FABRIC TREATMENT COMPOSITIONS CONTAINING POLYGLYCEROL ESTERS

Charles B. McCarty, and Paul Seiden, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

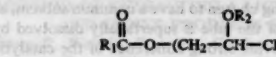
Continuation of Ser. No. 851,249, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 647,969, Jan. 9, 1976, abandoned. This application Jan. 22, 1979, Ser. No. 5,114

Int. Cl.[2] B32B *9/04;* B08B *3/00;* F26B *7/00*

U.S. Cl. 428—411 13 Claims

1. An article adapted for providing fabric softening within an automatic clothes dryer, said article comprising:

(a) a fabric softening amount of softening composition comprising a fatty alkyl polyglycerol ester softener component having the formula



wherein $R_1$ is a $C_9$ to $C_{23}$ aliphatic acylic hydrocarbyl group, and $R_2$ and $R_3$ are selected from the group consisting of hydrogen and $C_8$ to $C_{24}$ fatty acyl groups and n is from about 2 to about 4, wherein the crystal melting point of said fatty polyglycerol ester is above about 38° C., and wherein the degree of esterification of said polyglycerol ester is from about 0.2 to about 0.6; and

(b) a dispensing means which provides for release of said softening composition within an automatic laundry dryer at dryer operating temperatures, wherein when said dispensing means is a flexible substrate in a sheet configuration the softening composition is impregnated or coated onto the substrate to provide a weight ratio of softening composition to dry substrate ranging from about 10:1 to 0.5:1.

---

**4,214,039**

## POLYPROPYLENE FILM WITH PRIMER OF A WATER DISPERSED EPOXY RESIN COATING

**Robert H. Steiner, Rochester; Gary L. Duncan, Pittsford, and Robert E. Touhsaent, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 828,585, Aug. 29, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,073**

**Int. Cl.² B32B *27/38***

**U.S. Cl. 428—414** **12 Claims**

1. A thermoplastic film substrate having a topcoat of a heat sealable vinylidene chloride multi-polymer containing at least 50% by weight of vinylidene chloride, said film having a primer coat, intermediate said substrate film surface and said topcoat, comprising the reaction product of an acidified aminoethylated vinyl polymer and an epoxy resin.

7. A polypropylene film substrate having a topcoat consisting of a sealable vinylidene chloride polymer containing at least 50% by weight of vinylidene chloride, said polypropylene film having a primer coat intermediate said substrate film surface and said topcoat, said primer coat consisting of the reaction product of an acidified aminoethylated vinyl polymer and an epoxy resin.

---

**4,214,040**

## CROSS-LINKABLE, SATURATED POLYESTER COATING COMPOSITIONS

**Jacques Meyer, Paris, and Daniel Bernelin, Ris Orangis, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Apr. 6, 1978, Ser. No. 893,932**

**Claims priority, application France, May 23, 1977, 77 15622**

**Int. Cl.² C08G *63/70*; B32B *15/08, 27/36***

**U.S. Cl. 428—458** **29 Claims**

1. A thermosetting composition of matter comprising (i) a cross-linkable, saturated, hydroxylated polyester resin, (ii) a cross-linking agent for the polyester (i), said cross-linking agent being a compound comprised of both a carboxylic acid anhydride moiety and a carboxylic acid function, and (iii) a metallic oxide, the metal cation of which oxide is selected from the group consisting of zinc, magnesium, cadmium, iron (II) and alkaline earth in an amount between about 0.5% and 5% by weight metal with respect to the weight of the polyester resin.

**4,214,041**

## COMPOSITE ALUMINUM CAPACITOR FOIL

**Julius C. Fister, Jr., Hamden, Conn.; William C. Setzer, Creve Coeur, Mo., and Leon Cox, Pinson, Tenn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Filed Dec. 1, 1978, Ser. No. 965,592**

**Int. Cl.² B21C *37/00*; C25D *7/04***

**U.S. Cl. 428—607** **11 Claims**

1. A composite aluminum capacitor foil having a thickness from 0.0001 to 0.01 inch and having a relatively lower purity core of an aluminum base alloy having not less than about 0.03% each iron and silicon clad on both sides with a relatively higher purity aluminum base alloy having not more than about 0.02% each iron and silicon, wherein said cladding constitutes not more than 20% of the thickness of said composite on each side, wherein said composite is characterized by low cost and good capacitance and leakage characteristics.

---

**4,214,042**

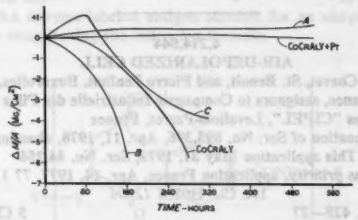
## TITANIUM BEARING MCRALY TYPE ALLOY AND COMPOSITE ARTICLES

**Lloyd W. Wilson, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 23, 1977, Ser. No. 863,818**

**Int. Cl.² B32B *15/00***

**U.S. Cl. 428—678** **5 Claims**




1. A coated article having hot corrosion resistance comprising:

(a) a substrate selected from the group consisting of iron, nickel and cobalt base alloys; and

(b) an MCrAlY type overlay alloy coating on said substrate, said coating consisting of by weight about 3–6 percent titanium, about 10–40 percent chromium, about 9–25 percent aluminum and about 0.01–5.0 percent reactive metal selected from the group consisting of yttrium, scandium, thorium and other rare earth elements, balance selected from the group consisting of nickel, cobalt and iron, said coated article having improved resistance to hot corrosion by virtue of the presence of titanium in the coating.

---

**4,214,043**

## RECHARGEABLE ELECTROCHEMICAL CELL

**Hubert J. H. van Deutekom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 833,301, Sep. 14, 1977, abandoned. This application May 4, 1978, Ser. No. 902,712**

**Claims priority, application Netherlands, Feb. 3, 1978, 7801243**

**Int. Cl.² H01M *4/00***

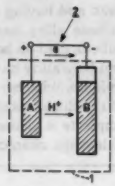
**U.S. Cl. 429—27** **3 Claims**

1. A rechargeable electrochemical cell which is sealed from the external environment, comprising, in a chamber which is sealed from the environment:

a positive electrode comprising an electrochemically active material selected from the group consisting of nickel hydroxide, silver oxide and manganese oxide;

a negative electrode made of an electrochemically active

material comprising $LaNi_n$, n being between 4.8 and 5.4, wherein La may be partially substituted with an element selected from the group consisting of calcium, thorium, titanium, rare earth metals and yttrium, and wherein Ni may be partially substituted with an element selected from the group consisting of copper, chromium and iron, said $LaNi_n$ or substitution product thereof having a $CaCu_5$ crystal structure; and




an aqueous electrolyte having a pH exceeding 7;

wherein the quantity of the electrochemically active material of the negative electrode exceeds that of the positive electrode by at least approximately 15%, and in the fully discharged state of the positive electrode the electrochemically active compound of the negative electrode, as regards the excess, is at least partially present as a hydride, namely in the charged state.

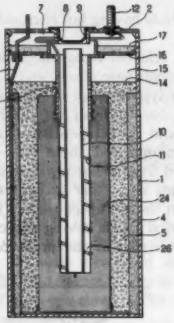
---

**4,214,044**

## AIR-DEPOLARIZED CELL

**Robert Chevet, St. Benoit, and Pierre Lenfant, Buxerolles, both of France, assignors to Compagnie Industrielle des Piles Electriques "CIPEL", Levallois-Perret, France**

**Continuation of Ser. No. 895,396, Apr. 11, 1978, abandoned.**
**This application May 31, 1979, Ser. No. 44,256**
**Claims priority, application France, Apr. 14, 1977, 77 11234**
**Int. Cl.[2] H01M *12/06***
**U.S. Cl. 429—27** **5 Claims**




1. An air-depolarized electric cell having a casing with oxygen-impermeable bottom and sides, a positive electrode including a catalytic mass containing an organic binder, a negative electrode, an electrolyte disposed between the electrodes, an oxygen-impermeable transverse wall sealed to the sides of the casing and spaced above the negative electrode and electrolyte to provide a gas space between the wall and the electrolyte, a ventilation duct formed within the positive electrode, and a tube sealingly extending through said transverse wall and entering the ventilation duct for connecting the interior of the catalytic mass to a source of oxygen on the other side of the transverse wall from said gas space, wherein the improvement comprises:

said tube being made of a plastic material impervious to oxygen, the catalytic mass being molded around the tube, and the binder for the catalytic mass and the plastic material of the tube being chosen to have a common solvent, so that the material of the tube is superficially dissolved by said solvent to provide strong adherence of the catalytic mass to the tube.

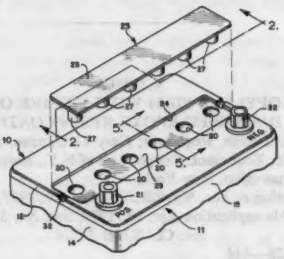
---

**4,214,045**

## CONTAINER FOR A MAINTENANCE-FREE BATTERY

**Gottfried W. Jutte, Indianapolis, and John V. McHugh, Greenfield, both of Ind., assignors to The Richardson Company, Des Plaines, Ill.**

**Filed Aug. 21, 1978, Ser. No. 935,250**
**Int. Cl.[2] H01M *2/12***
**U.S. Cl. 429—87** **24 Claims**




1. A battery container for a battery comprising, in combination:

a container base including side walls forming a compartment for the battery;

means for enclosing said container base including a cover member having a top surface, a bottom surface adapted for engaging the side walls of said container base, a recess on said top surface defining a first opposing surface, and at least one filler well portion extending from said recess to the interior of the battery container, and a flange portion generally surrounding said filler well portion;

a vent cover including a generally flat body portion seated within said recess and dimensioned to provide a gas escape gap between the side walls of said recess and the side walls of said vent cover, and a bottom surface defining a second opposing surface;

venting means including at least one vent plug portion projecting from said bottom surface of said vent cover body portion, said one vent plug portion having a sidewall extending through said filler well into the interior of the battery container, and an axially directed recess between said vent plug sidewall and filler well for establishing a first passageway for conveying gases egressing from said battery container, said vent plug portion including a lug portion which cooperates with said flange portion to secure said vent cover to said means for enclosing said container base; and

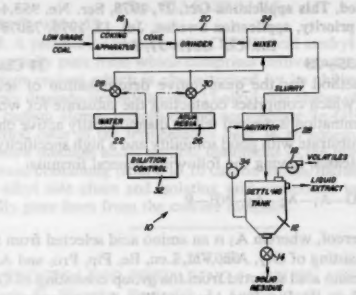
means including at least one rib portion on at least one of said opposing surfaces for spacing said bottom surface of said vent cover from said first opposing surface of said recess to form a second passageway, said second passageway providing gas passing communication between said first passageway and said gas escape gap.

## 4,214,046

## METHOD OF EXTRACTING A LIQUID ELECTROLYTE AND OTHER PRODUCTS FROM COAL

Owen R. Waltrip, Roseville, Calif., assignor to Nuclear Supreme, Casper, Wyo.

Filed Feb. 15, 1979, Ser. No. 12,561
Int. Cl.[2] H01M 6/04, 10/08
U.S. Cl. 429—198 15 Claims




1. A method of producing a liquid extract, substantially free of metallic components, from a carbonaceous material containing trace amounts of the metallic components, including the steps of: reducing the carbonaceous material to particle size; mixing the particles of carbonaceous material with an acid having metal dissolving and oxidizing powers; diluting the acid before said mixing to regulate said dissolving and oxidizing powers resulting in formation of a mixture having a solid phase within which the metallic components are confined; and settling the mixture to separate a liquid phase from the solid phase as the liquid extract.

---

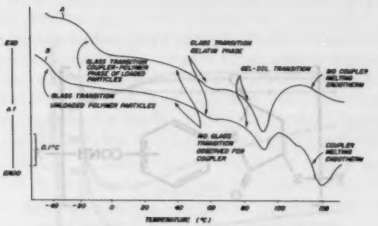
## 4,214,047

## PHOTOGRAPHIC ELEMENTS HAVING HYDROPHILIC COLLOID LAYERS CONTAINING HYDROPHOBIC ADDENDA UNIFORMLY LOADED IN LATEX POLYMER PARTICLES

Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 936,155, Aug. 23, 1978, abandoned, which is a continuation of Ser. No. 880,684, Feb. 23, 1978, which is a continuation of Ser. No. 744,680, Nov. 24, 1976, abandoned, and Ser. No. 778,182, Mar. 16, 1977, abandoned, each is a continuation-in-part of Ser. No. 653,816, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 575,680, May 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 506,919, Sep. 17, 1974, abandoned. Continuation of Ser. No. 778,184, Mar. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 744,842, Nov. 24, 1976, abandoned, which is a continuation-in-part of said Ser. No. 653,816, which is a continuation-in-part of said Ser. No. 575,680, which is a continuation-in-part of said Ser. No. 506,919. This application May 4, 1979, Ser. No. 36,262
Int. Cl.[2] G03C 5/24, 1/76, 3/00
U.S. Cl. 430—448 42 Claims

1. In a photographic element comprised of
a support and, coated on the support,
one or more hydrophilic colloid layers, at least one of which is a silver halide emulsion layer,
the improvement in which at least one of the hydrophilic colloid layers contains in a photographically useful amount loaded polymer particles of from 0.02 to 0.2 micron in average diameter consisting essentially of a loadable polymer, with greater than 2 percent by weight of the polymer being derived from monomers capable of forming water soluble homopolymers, and, loaded into and distributed through said particles, a hydrophobic developing agent, the weight ratio of the




hydrophobic developing agent to said loadable polymer being from about 1:4 to 3:1.

---

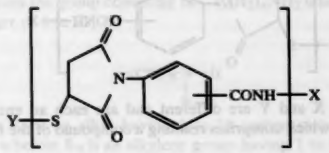
## 4,214,048

## REAGENT SUITABLE FOR ENZYME IMMUNO ASSAY

Tsunehiro Kitagawa, Nagasaki, Japan, assignor to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

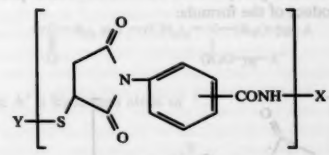
Division of Ser. No. 748,135, Dec. 6, 1976, Pat. No. 4,150,033. This application Apr. 26, 1978, Ser. No. 900,167
Claims priority, application Japan, Dec. 12, 1975, 50-148787
Int. Cl.[2] C12Q 1/66; C12N 9/96
U.S. Cl. 435—7 18 Claims

1. An enzyme-labeled antigen suitable for an enzyme immuno assay having the following formula:




wherein X and Y are different and are each an enzyme or antigen.

14. In a method for conducting an enzyme immuno assay which comprises subjecting an enzyme-labeled antigen, an unlabeled antigen and an antibody to a competitive antigen-antibody reaction in a buffered solution, separating the enzyme-labeled antigen bound to the antibody from the free labeled antigen, and determining the amount of the unlabeled antigen by measuring an enzyme activity of either the labeled antigen bound to the antibody or the free labeled antigen, the improvement wherein the enzyme-labeled antigen has the following formula:

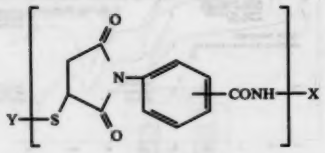



wherein X and Y are different and are each an enzyme or antigen.

15. A kit for an enzyme immuno assay which comprises subjecting an enzyme-labeled antigen, an unlabeled antigen and an antibody to a competitive antigen-antibody reaction in a buffered solution, separating the enzyme-labeled antigen bound to the antibody from the free labeled antigen, and determining the amount of the unlabeled antigen by measuring an enzyme activity of either the labeled antigen bound to the

antibody or the free labeled antigen, said kit containing the following three components as essential components:

Component A: an enzyme-labeled antigen of the formula:

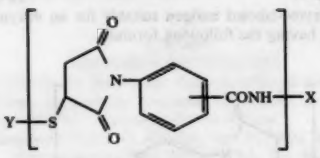


wherein X and Y are different and are each an enzyme or antigen,

Component B: an antibody against the antigen of component A, and

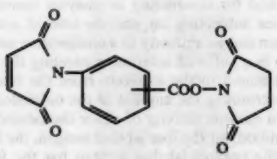
Component C: a substrate for the enzyme of the component A.

17. A process for preparing an enzyme-labeled antigen suitable for an enzyme immuno assay having the following formula:



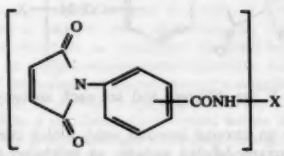
(II)

wherein X and Y are different and are each an enzyme or antigen, which comprises reacting a compound of the formula:



(I)

with an antigen or enzyme containing an amino group but having no thiol group under conditions which produce a bound product of the formula:



(III)

wherein X is the same as defined above,

and reacting the resulting bound product (III) with an enzyme or antigen containing a thiol group under conditions which produce the enzyme labeled antigen.

**4,214,049**

## ASSAY OF SERINE PROTEASES USING NOVEL CHROMOGENIC ENZYME SUBSTRATES

**Bo T. af Ekenstam, Mölndal; Leif E. Aurell; Karl G. Claeson, both of Särö; Birgitta G. Karlsson; Stig I. Gustavsson, both of Mölndal, and Gun A. Olausson, Västra Frölunda, all of Sweden, assignors to AB Kabi, Stockholm, Sweden**

**Division of Ser. No. 888,586, Mar. 20, 1978, Pat. No. 4,137,225, which is a continuation of Ser. No. 697,002, Jun. 17, 1976, abandoned. This application Oct. 27, 1978, Ser. No. 955,441**

**Claims priority, application Sweden, Jul. 11, 1975, 7507974**

**Int. Cl.[2] G01N *31/14***

**U.S. Cl. 435—23** **31 Claims**

1. A method for the quantitative determination of serine proteases which comprises contacting the substrate for which said determination is desired with a diagnostically active chromogenic substrate with good solubility and a high specificity to serine proteases, having the following general formula:

$$H—D—A_1—A_2—A_3—NH—R$$

or salts thereof, wherein $A_1$ is an amino acid selected from the group consisting of Gly, Ala, Val, Leu, Ile, Pip, Pro, and Aze; $A_2$ is an amino acid selected from the group consisting of Gly, Ala, Val, Leu, Ile, Pip, Pro, Aze, and Phe; $A_3$ is an amino acid selected from the group consisting of Arg, Lys, and Orn; and R is a chromophoric group, and then spectrophotometrically measuring the degree of enzymatic hydrolysis.

---

**4,214,050**

## PREVENTION OF ELECTRODE FOULING

**George A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.**

**Filed Nov. 6, 1978, Ser. No. 957,947**

**Int. Cl.[2] C12Q *1/29***

**U.S. Cl. 435—29** **22 Claims**

1. In a process wherein the pH of the anaerobic bacteria-containing liquid of a continuous anaerobic digestion process is monitored by means of a pH measuring device containing electrodes which are immersed in said bacteria-containing liquid in order to obtain a measurement of the pH of said bacteria-containing liquid, said electrodes comprising a reference electrode and a glass electrode, said anaerobic digestion process being one wherein the anaerobic bacteria of said bacteria-containing liquid decompose organic molecules to mainly carbon dioxide and methane, the improvement which comprises cyclically immersing said electrodes in said bacteria-containing liquid and in a bactericidal solution so as to prevent fouling of said electrodes, each cycle comprising a first time period during which said electrodes are immersed in said bacteria-containing liquid in order to measure the pH thereof and a second time period during which said electrodes are immersed in said bactericidal solution, the time ratio of said first time period to said second time period being no greater than about 10:1, said first time period of said cycle during which said electrodes are immersed in said bacteria-containing liquid not exceeding about ten hours in duration, said bactericidal solution containing a bactericide which is effective in killing said anaerobic bacteria, and said bactericidal solution containing an amount of said bactericide effective to kill the anaerobic bacteria remaining on the said electrodes after their having been immersed in the said bacteria-containing liquid.

4,214,051

## PROCESS FOR PREPARING 9α-OH BN ACID METHYL ESTER

Merle G. Wovcha; Frederick J. Antosz, both of Kalamazoo; John M. Beaton, Portage; Alfred B. Garcia, Kalamazoo, and Leo A. Kominek, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 844,366, Oct. 21, 1977. This application Apr. 23, 1979, Ser. No. 32,184
Int. Cl.[2] C12P 33/16
U.S. Cl. 435—55 11 Claims

8. A process for preparing 9α-OH BN acid methyl ester in its essentially pure form which comprises cultivating a Mycobacterium mutant which is characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 8 to 10 carbon atoms, inclusive, and accumulate 9α-OH BN acid methyl ester in the fermentation beer, in an aqueous nutrient culture medium under aerobic conditions in the presence of a steroid containing from 8 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and isolating said compound in its essentially pure form from the culture medium.

---

4,214,052

## PROCESS FOR PREPARING 9α-OH BN ALCOHOL

Merle G. Wovcha; Frederick J. Antosz, both of Kalamazoo; John M. Beaton, Portage; Alfred B. Garcia, Kalamazoo, and Leo A. Kominek, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 844,366, Oct. 21, 1977. This application Apr. 23, 1979, Ser. No. 32,185
Int. Cl.[2] C12P 33/16
U.S. Cl. 435—55 11 Claims

1. A process for preparing 9α-OH BN alcohol in its essentially pure form which comprises cultivating *Mycobacterium fortuitum* NRRL B-8119 in an aqueous nutrient culture medium under aerobic conditions in the presence of a steroid containing from 8 to 10 carbon atoms, inclusive, in the 17-alkyl side chain and isolating said compound in its essentially pure form from the culture medium.

---

4,214,053

## LATEX FOAM RUBBER

David Porter, Sarnia, Canada, assignor to Polysar International, S.A., Fribour, Switzerland

Filed Jan. 29, 1979, Ser. No. 7,509
Claims priority, application Canada, Dec. 18, 1978, 318128
Int. Cl.[2] C08J 9/30
U.S. Cl. 521—70 10 Claims

1. A method for broadening the gel range of alkali metal fluosilicate gelling agents, in foamed acid-coagulable rubber latex polymer compounds which are to be gelled by subjecting them to a preliminary heat treatment prior to drying, comprising including in the latex compound a water-soluble ammonium or amine sulfamate in an amount of at least 0.5 part by weight of sulfamate per 100 parts by weight of dry solids in the uncompounded latex, said sulfamate being one which hydrolyzes in water when the temperature is raised but which is characterized by little or no hydrolysis in water at ambient temperatures and being one in which the ammonium or amine radical is derived from an amine (including ammonia) which has a boiling point in the range of −35° C. to +300° C.

---

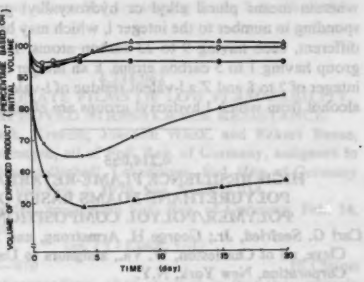
4,214,054

## EXPANDED OLEFIN POLYMER

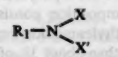
Seizaburo Watanabe, and Yutaka Matsuki, both of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Oct. 19, 1978, Ser. No. 952,865
Int. Cl.[2] C08J 9/14
U.S. Cl. 521—95 6 Claims

1. An expanded article of an olefin polymer comprising an expanded product of an olefin polymer containing at least one compound, which imports little shrinkage to said expanded article after expansion selected from the group consisting of the compounds represented by the formulas (I), (II) and (III) as set forth below in an amount of 0.1 to 10% by weight based on the weight of said resin and having a closed cellular character-

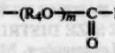



istic value of 0 to 0.5 g/cm$^3$, a bulk density of 10 to 200 kg/m$^3$ and a compressive strength coefficient of $2.15\times10^{-3}$ to $2.89\times10^{-2}$:

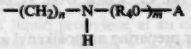

(I)

wherein $R_1$ is an alkyl group having 10 to 24 carbon atoms, X and X' each hydrogen atom, an alkyl group having 1 to 24 carbon atoms which may be substituted or a substituent selected from the group consisting of $-(CH_2)_nNH_2$ wherein n is an integer of 1 to 22,

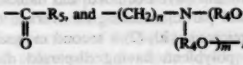
wherein $R_5$ is an alkyl having 1 to 24 carbon atoms, $-(R_4O)_mH$ wherein $R_4$ is an alkylene group having 1 to 5 carbon atoms and m an integer of 1 to 10,



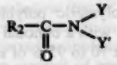
wherein $R_5$ is an alkyl having 1 to 24 carbon atoms,



wherein n is an integer of 1 to 22 and A is hydrogen atom or



wherein A' is hydrogen atom or


(II)

wherein $R_2$ is an alkyl group having 9 to 23 carbon atoms, Y and Y' each hydrogen atom, an alkyl having 1 to 24 carbon atoms, an acyl having 10 to 24 carbon atoms or a substituent of the formula $-(R_4O)_mA_2$ wherein $A_2$ is hydrogen atom, an alkyl having 1 to 24 carbon atoms or acyl having 10 to 24 carbon atoms;

$$[R_3]_l C-(OR_4)_k-O]_l Z \quad (III)$$
$$\|$$
$$O$$

wherein means plural alkyl or hydroxyalkyl groups corresponding in number to the integer l, which may be the same or different, each having 9 to 23 carbon atoms, $R_4$ an alkylene group having 1 to 5 carbon atoms, k an integer of 0 to 7, l an integer of 2 to 8 and Z a l-valent residue of l-valent polyhydric alcohol from which l hydroxyl groups are eliminated.

---

**4,214,055**

## HIGH RESILIENCE FLAME-RETARDANT POLYURETHANE FOAMS BASED ON POLYMER/POLYOL COMPOSITIONS

**Carl G. Seefried, Jr.; George H. Armstrong, and Russell Van Cleve, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Nov. 17, 1978, Ser. No. 961,717**
**Int. Cl.[2] C08G** *18/14, 18/63;* **C08K** *5/06;* **C09K** *3/00*
**U.S. Cl. 521—137** **4 Claims**

1. A high resilience flame-retardant urethane foam made from tolylene diisocyanate and a polymer/polyol composition, said polymer/polyol composition consisting essentially of a stable dispersion, in an ethylene oxide-capped polyol having a hydroxyl number of less than about 38, of an interpolymer of a monomer mixture composed of a minor amount of acrylonitrile and a major amount of vinylidene chloride.

3. A polymer/polyol composition consisting essentially of a stable dispersion, in an ethylene oxide-capped polyol having a hydroxyl number of less than about 38, of an interpolymer of a monomer mixture composed of a minor amount of acrylonitrile and a major amount of vinylidene chloride, the amount by weight of monomer mixture required, relative to the polyol, sufficient to provide a high resilience, flame-retardant polyurethane foam.

---

**4,214,056**

## METHOD FOR PREPARING A MONOALKENYL AROMATIC POLYBLEND HAVING A DISPERSED RUBBER PHASE AS PARTICLES WITH A BIMODAL PARTICLE SIZE DISTRIBUTION

**Richard E. Lavengood, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation of Ser. No. 907,521, May 19, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 28,414**
**Int. Cl.[2] C08L** *9/06, 51/04*
**U.S. Cl. 525—71** **25 Claims**

1. A method for preparing monoalkenyl aromatic polymeric polyblends having improved toughness which comprises blending (1) a first monoalkenylaromatic polymeric polyblend having dispersed diene rubber particles, said rubber particles being grafted with and have occluded said monoalkenyl aromatic polymer, said particles having an average diameter of about 0.5 to 1.0 microns with (2) a second monoalkenyl aromatic polymeric polyblend having dispersed diene rubber particles, said particles being grafted with and having occluded said monoalkenyl aromatic polymer, said particles having an average diameter of about 2.0 to 3.0 microns forming a third monoalkenyl aromatic polymeric polyblend, having a dispersed diene rubber phase with a bimodal rubber particle size distribution wherein about 70 to 95% of said rubber particles have an average diameter of about 0.5 to 1.0 microns and 5 to 30% of said rubber particles have an average diameter of about 2.0 to 3.0 microns providing said third polyblend with improved toughness and gloss said first and second polyblends being prepared by polymerization of a solution of a monoalkenyl aromatic monomer having said diene rubber dissolved therein.

**4,214,057**

## COATING COMPOSITION FOR PLASTIC SUBSTRATES

**Shunichi Ishihara, Chiba, and Toraichi Katsube, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Feb. 15, 1978, Ser. No. 877,934**
**Int. Cl.[2] C08L** *83/06, 33/06*
**U.S. Cl. 525—100** **9 Claims**

1. A coating composition consisting essentially of:

(A) the hydrolyzed product of a tetraalkoxysilane of the formula

$$Si(OR)_4 \quad (I)$$

wherein R is an alkyl group of 1 to 4 carbon atoms

(B) the hydrolyzed product of one or more silicon compounds of the formula

$$R'Si(OR'')_3 \quad (II)$$

wherein R′ is a hydrocarbon group having 1 to 2 carbon atoms, R″ is a substituted or unsubstituted hydrocarbon group having 1 to 3 carbon atoms or an acyl group having 1 to 3 carbon atoms, and

(C) poly (vinyl acetate), the sum of the percentages A, B, and C equalling 100 percent and on triangular coordinates the proportions by weight of the components (A), (B) and (C) falling in the area defined by:

(A):(B):(C)=40:42.5:17.5 (percent by weight)
(A):(B):(C)=17.5:72.5:10 (percent by weight)
(A):(B):(C)=17.5:60:22.5 (percent by weight)
(A):(B):(C)=40:35:25 (percent by weight).

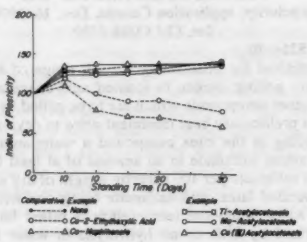
---

**4,214,058**

## VULCANIZABLE RUBBER COMPOSITION CONTAINING METAL ORGANIC COMPOUNDS

**Takaaki Imamura, Akigawa; Takahiro Kawagoe, Tokorozawa; Toshio Chikaraishi, Akigawa, and Takashi Nyomura, Kodaira, all of Japan, assignors to Bridgestone Tire Company, Tokyo, Japan**

**Filed Oct. 17, 1977, Ser. No. 842,995**
**Claims priority, application Japan, Oct. 20, 1976, 51-125031**
**Int. Cl.[2] C08C** *19/26, 19/20;* **C08F** *36/04*
**U.S. Cl. 525—348** **14 Claims**




1. A vulcanizable rubber composition having an excellent adhesive property when vulcanized in contact with metals which comprises

(a) 100 parts by weight of a diene type rubber

(b) from 0.5 to 10 parts by weight of a vulcanizing agent selected from the group consisting of sulfur, morpholine disulfide, 2-(4′-morpholinodithio) benzothiazole and thiuram compounds and

(c) from 0.01 to 1 part by weight (as metal content) of at least one metal compound selected from the class consisting of an aliphatic carboxylic acid salt, an alicyclic carboxylic acid salt and an aromatic carboxylic acid salt of titanium and molybdenum, titanyl acetylacetonate, bis-tris(acetylacetonate) titanium (IV), hexachlorotitanate (IV), mo-

lybdenyl acetylacetonate, and molybdenum (III) acetylacetonate.

---

4,214,059

## METHOD FOR THE PRODUCTION OF IODOPHOR POWDERS

Peter Hofer, Liestal, Switzerland, assignor to The Purdue Frederick Company, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,683
Int. Cl.[2] A01N *11/00*; C08F *8/22*
U.S. Cl. 525—356 11 Claims

1. Method of producing an iodophor powder, which comprises adding to a suspension of a powdered iodophor-forming compound in a solution of iodine dissolved in a solvent in which said iodophor-forming compound is insoluble an iodide dissolved in a solvent system miscible with said solvent for said iodine, thus causing iodine to add to said iodophor-forming compound to form the corresponding iodophor in solid form.

---

4,214,060

## FLUOROPOLYMER COMPOSITION

David Apotheker, and Paul J. Krusic, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 562,648, Mar. 27, 1975, Pat. No. 4,035,565. This application Nov. 30, 1976, Ser. No. 746,002
Int. Cl.[2] C08F *214/16*
U.S. Cl. 525—387 26 Claims

1. A fluoropolymer composition which comprises

(A) a copolymer whose interpolymerized units consist essentially of

(1) up to 3 mole % of units derived from a bromine-containing olefin with the proviso that enough of such units are present to provide at least 0.05 weight % bromine in the copolymer, and

(2) enough units derived from component (2.1) or (2.2) as follows to make up the remainder of the copolymer:

(2.1) at least one fluorine-containing monomer which is copolymerizable with component (1), contains 2–7 carbon atoms, contains no bromine atom, and contains at least as many fluorine atoms as carbon atoms, or

(2.2) about 50–99 mole % of tetrafluoroethylene, about 1–50 mole % of a $C_2$-$C_4$ olefinic hydrocarbon and from 0 to about 30 mole % of vinylidene fluoride, and

(B) about 0.5–10% of an organic peroxide based on the weight of component (A).

---

4,214,061

## PRESSURE-SENSITIVE ADHESIVE

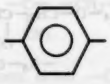
Yu-Sun Lee, Parma Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,600
Int. Cl.[2] C08L *75/00*
U.S. Cl. 525—455 31 Claims

1. A pressure sensitive adhesive composition comprising the reaction product of (A) at least one alkyl acrylate liquid polymer containing both terminal and random hydroxyl functionality totaling an average of about 1.4 to about 6 hydroxyl groups per molecule, and having the formula

$$HO—X—(S)_k—D—(S)_k—X—OH$$

wherein k is 1 or 2, X is $(C_nH_{2n}O)_m(C_nH_{2n})_p$ or $(C_nH_{2n})_m$



m is an integer from 0 to 10; n and p are integers from 1 to 10; and D is an aliphatic backbone containing polymerized units of at least 65 weight percent based upon the total polymer weight of at least one alkyl acrylate wherein the alkyl group contains from 3 to 10 carbon atoms, (B) at least one isocyanate prepolymer of a polyester glycol or a polyalkylene ether glycol, and (C) at least one alkanediol containing from 3 to 10 carbon atoms.

---

4,214,062

## POLYCARBONATE FILMS OF LOW FLAMMABILITY AND IMPROVED STRESS CRACK RESISTANCE

Rudolf Binsack, Krefeld; Joachim Wank, and Eckart Reese, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,014
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706126
Int. Cl.[2] C08K *5/42*
U.S. Cl. 525—470 18 Claims

1. Polycarbonate films, characterized in that they contain about 0.01% by weight to 2% by weight of a $NH_4$ salt, alkali metal salt or alkaline earth metal salt of a perhalogenoalkanesulphonic acid.

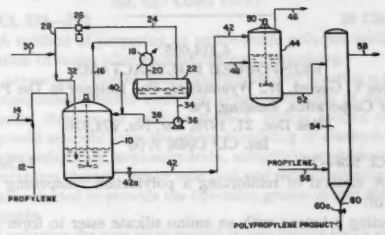
---

4,214,063

## AUTOREFRIGERATED POLYMERIZATION PROCESS

Edwin D. Luallin, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 11, 1979, Ser. No. 2,627
Int. Cl.[2] C08F *2/02, 6/28*
U.S. Cl. 526—68 10 Claims




1. A method for producing a solid polypropylene or propylene copolymer product which comprises:

contacting a Ziegler-type polymerization cocatalyst system with a body of liquid propylene at an elevated temperature in a reaction zone having a propylene liquid phase and a propylene vapor phase whereby heat of reaction is removed by continuously withdrawing the vapor phase from the reaction, said reaction zone being maintained at a temperature and pressure whereby the liquid phase and vapor phase are in equilibrium;

withdrawing portions of the liquid phase as a slurry containing solid polymerized product, liquid propylene, amorphous polymer and catalyst residue from the reaction zone;

introducing the slurry into a degassing zone being maintained at pressure below that of the reaction zone to convey the slurry from the reaction zone with concommitant removal of vaporized propylene therefrom;

adding an effective amount of agents for catalyst deactivation and solubilization to the slurry in the degassing zone for a time sufficient to deactivate and solubilize catalyst residues;

introducing the slurry into a wash zone maintained at substantially the same pressure of said degassing zone;

contacting the slurry with liquid propylene countercurrently in the wash zone to separate deactivated, solubi-

lized catalyst residue and amorphous polymer from the solid polymer product; and

recovering the resulting purified solid polymer product.

---

**4,214,064**

## PROCESS FOR PRODUCING A CASTING PLATE OF POLYMETHYL METHACRYLATE

**Hiroyuki Kanazawa, Niihama, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Continuation of Ser. No. 640,387, Dec. 12, 1975, abandoned. This application Nov. 30, 1977, Ser. No. 856,019**

**Claims priority, application Japan, Dec. 13, 1974, 49-143737**

**Int. Cl.[2] C08F 2/44, 2/02, 20/18**

**U.S. Cl. 526—193** **3 Claims**

1. In a process for producing a casting plate of polymethyl methacrylate by continuously subjecting a methyl methacrylate monomer or a syrup containing soluble polymeric resins in the methyl methacrylate monomer incorporated with a sulfur-containing compound selected from the group consisting of dioctyl sulfide, 1,3-di-n-dodecylthiopropane, ethyl dodecyl thiopropionate, methyl dodecyl thioisobutyrate, dilauryl thiodipropionate, distearyl thiodipropionate, lauryl stearyl thiodipropionate, dibutyl thiodiundecathiolate and dioctyl thiodiundecathiolate, in an amount of 0.005 to 5% by weight based on the produced polymer, to casting polymerization, the improvement which consists essentially of adding a surfactant selected from the group consisting of an anionic or nonionic surfactant to the starting mixture comprising the monomer or syrup incorporated with the sulfur-containing compound in an amount of 0.0001 to 1% by weight based on the produced polymer to obtain the casting plate having an improved thermal stability.

---

**4,214,065**

## REINFORCED POLYLACTAMS

**Charles V. Goebel, Jr., Wyomissing, Pa., assignor to The Polymer Corporation, Reading, Pa.**

**Filed Dec. 21, 1978, Ser. No. 971,926**

**Int. Cl.[2] C08K 9/06**

**U.S. Cl. 528—27** **7 Claims**

1. A method of reinforcing a polylactam comprising the steps of:

reacting a ketene with an amino silicate ester to form a $\beta$ keto-amide and a reactive silicate ester end group;

treating the surface of inorganic filler particles by reaction with the silicate ester end group;

dispersing the treated filler particles in a lactam monomer; and

adding a catalyst and heating the dispersion to initiate a base catalized, anionic polymerization of the lactam.

---

**4,214,066**

## ORGANOPOLYSILOXANES MODIFIED WITH POLY-CARBODIIMIDE

**Hans-Heinrich Moretto, Cologne; Helmut Steinberger, Leverkusen, both of Fed. Rep. of Germany; Ingrid Larking, Landvetter, Sweden, and Hans Sattlegger, Odenthal-Gloebusch, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

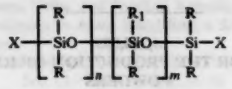
**Filed Jun. 22, 1978, Ser. No. 918,128**

**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730743**

**Int. Cl.[2] C08G 77/04**

**U.S. Cl. 528—28** **7 Claims**

1. A process for preparing a polysiloxane modified with polycarbodiimide characterized in that the polysiloxane and polycarbodiimide are present as discernible phases, which comprises mixing a liquid polysiloxane of the following formula:



in which

R represents an optionally substituted alkyl, alkenyl or halogenoalkyl radical with up to about 10 C atoms,

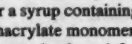
$R_1$ represents hydrogen or an optionally substituted alkyl, alkenyl, aryl or halogenoalkyl radical with up to about 10 C atoms;

X is hydroxyl-, vinyl- or methyl-;

n=2 to about 1,000 and

m=0 to about 50

with a polyisocyanate of the formula



in which

R′ represents an alkylene or arylene radical with up to 24 C atoms which is optionally also substituted by isocyanate groups,

and a catalyst which accelerates the carbodiimidization.

---

**4,214,067**

## SEALING COMPOSITION

**Marvin Packer, Broomall, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Dec. 14, 1977, Ser. No. 860,561**

**Int. Cl.[2] C08G 59/66**

**U.S. Cl. 528—93** **7 Claims**

1. A composition for sealing acrylic plastics in frames which is resistant to adhesion failure induced by thermal and moisture variations of ambient weather consisting of a diglycidyl ether of bisphenol A, a liquid polysulfide polymer in a concentration of from at least about 1.25 to about 1.8 times the diglycidyl ether of bisphenol A concentration and a curing agent in an amount sufficient to cure the composition.

---

**4,214,068**

## ESTERS CONTAINING PHENOLIC GROUPS AS EPOXY RESIN CURING AGENTS

**Gerardus C. M. Schreurs; Werner Th. Raudenbusch, and Theodorus N. Visser, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

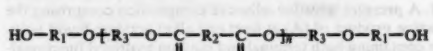
**Filed May 10, 1979, Ser. No. 37,609**

**Claims priority, application United Kingdom, May 22, 1978, 21051/78**

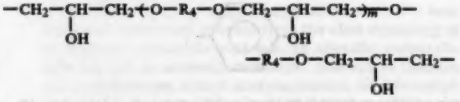
**Int. Cl.[2] C08G 59/62**

**U.S. Cl. 528—98** **9 Claims**

1. A phenolic compound, suitable as a curing agent for epoxy resins, having the generalized formula:



wherein n is a number having an average value of from 0.3 to 4, $R_1$ is the hydrocarbon residue of a dihydric phenol, $R_2$ is the hydrocarbon residue of a dicarboxylic acid, and $R_3$ is a divalent group having a formula:



wherein m is a number having an average value of from 0 to 4, and $R_4$ is the hydrocarbon residue of a dihydric phenol.

---

**4,214,069**

## FLAME-RESISTANT COPOLYESTERS CONTAINING PHOSPHONIC GROUPS

**Paul Couchoud, Dardilly, and Yves Vaginay, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France**

**Filed Oct. 12, 1977, Ser. No. 841,439**

**Claims priority, application France, Oct. 15, 1976, 76 31319; Dec. 29, 1976, 76 39701**

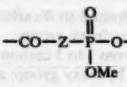
**Int. Cl.² C08G *63/18, 63/68***

**U.S. Cl. 528—167** **12 Claims**

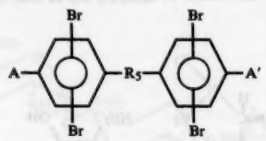
1. Flame-resistant copolyesters which may be spun and made into a film, characterized in that they consist essentially of from 85 to 96% of repeating units of the formula:

$$-CO-R-CO-O-R_1-O-$$

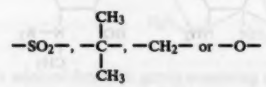
in which R, derived from acid reactants, is a divalent aromatic paraphenylene or 2,6-naphthylene radical, which may be replaced to the extent of at most 19.5 mol %, relative to the sum of the radicals R, by another aromatic radical selected from the metaphenylene group or by an aliphatic radical comprising from 6 to 12 carbon atoms, or to extent of at most 2 mol % by a trivalent or tetravalent radical, and in which $R_1$ is a divalent aliphatic or cycloalkane radical or a mixture of two or several of these radicals, which may be replaced by at most 2 mol % of a trivalent or tetravalent radical, the sum of the trivalent or tetravalent radicals not exceeding 2 mol %, relative to all of the acid reactants; from 2 to 10% of units of the formula:



in which Me represents a metal selected from Na, K, Ca or Zn, and Z represents the paraphenylene group or a divalent aliphatic group which contains from 1 to 18 carbon atoms, or a divalent aliphatic group which contains from 1 to 18 carbon atoms and hetero-atoms, and a branched aliphatic group which contains from 1 to 18 carbon atoms, the branch being an aliphatic radical which may be halogenated and having from 1 to 6 carbon atoms; and from 2 to 8% of units produced from a brominated compound of the formula:



in which $R_5$ is a direct bond or represents a group;



and A and A' represent either —CO—OX groups, where X=H or a lower alkyl group, or —X'OH groups, where X'=a $-(OCH_2-CH_2)_n$ group, and n=1 to 10.

---

**4,214,070**

## POLYMERS OF 2-KETOPENTAFLUOROPROPANESULFONIC ACID AND RELATED ACIDS WITH ETHYLENE OR FLUORINATED UNSATURATED MONOMERS

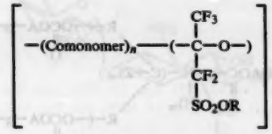
**Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 602,756, Aug. 7, 1975, Pat. No. 4,160,780. This application Jan. 18, 1979, Ser. No. 4,482**

**Int. Cl.² C08G *2/26***

**U.S. Cl. 528—220** **4 Claims**

1. A solid, moldable, dyeable copolymer of the formula



wherein the comonomer is ethylene, vinyl fluoride, vinylidene fluoride, tetrafluoroethylene or trifluoroethylene, R is H or $CF_2CH_3$ and n is 2–500.

---

**4,214,071**

## AMIDE-IMIDE POLYMERS

**William M. Alvino, Pittsburgh, and Lawrence W. Frost, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Division of Ser. No. 180,190, Sep. 13, 1971, Pat. No. 3,892,768. This application Apr. 11, 1975, Ser. No. 567,220**

**Int. Cl.² C08G *73/11***

**U.S. Cl. 528—222** **20 Claims**

1. A method of preparing an amide-imide polymer without liberation of water after polymerization, comprising:

(1) preparing a dinitro imide intermediate by reacting a first compound selected from the group consisting of nitroamine, diamine, or mixture thereof, with a second compound selected from the group consisting of dianhydride, nitroanhydride, acyl-anhydride, anhydride equivalent, or mixtures thereof, where said first and second compounds are selected to provide the two nitro groups in said dinitro imide;

(2) reducing the two nitro groups in said dinitro imide intermediate to amino groups to form a diamino imide intermediate; and

(3) reacting said diamino imide intermediate with at least one diacid halide to produce said amide-imide polymer.

---

**4,214,072**

## PROCESS FOR THE MANUFACTURE OF LINEAR HIGH MOLECULAR WEIGHT POLYESTERS

**Hans-Josef Sterzel, Dannstadt-Schauernheim; Kasimir Von Dziembowski, and Hans Pirzer, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Aug. 10, 1978, Ser. No. 932,632**

**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738093; Jan. 27, 1978, 2803530**

**Int. Cl.² C08G *63/18***

**U.S. Cl. 528—272** **10 Claims**

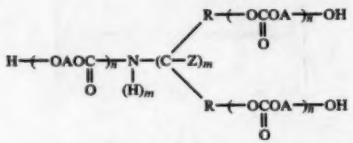
1. A process for the manufacture of high molecular weight linear polyesters which are derived from dicarboxylic acids or their ester-forming derivatives and from diols, which comprises condensing polyester precondensates, having a relative viscosity of at least 1.05, under reduced pressure the condensation being started at from 290° to 340° C. and the temperature being lowered as the condensation progresses, the final temperature being at least 10° C. above the melting point of the particular polyester produced.

## 4,214,073
## POLY-(CARBONATE-URETHANE)-TRIOLS AND PREPARATION THEREOF

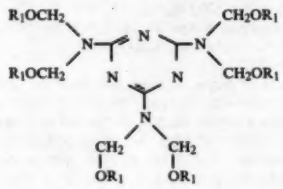
Claude G. Passagne, Champigny sur Marne; Jean-Pierre G. Senet, Melun; Remy R. Lippler, and Jacques Plazanet, both of Bergerac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Division of Ser. No. 855,963, Nov. 30, 1977, Pat. No. 4,165,423.
This application May 29, 1979, Ser. No. 43,340
Int. Cl.[2] C08G *18/00*
U.S. Cl. 528—369 2 Claims

1. A resin obtained by reaction of a poly-(carbonate-urethane)-triol of the formula:



wherein A is an alkylene or cycloalkylene group, R is an alkylene group having up to 4 carbon atoms, Z is an alkyl group having up to 4 carbon atoms, n is a number representing the degree of polymerisation, and m is an integer selected from 0 and 1, said poly-(carbonate-urethane)-triol having a molecular weight of less than 5000 and being liquid, with an etherified melamine-formaldehyde condensate of the formula:



where $R_1$ is an alkyl group having up to 4 carbon atoms.

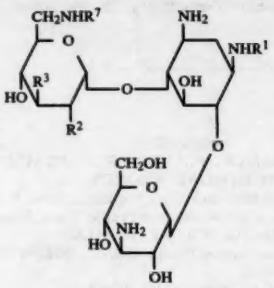
---

## 4,214,074
## HYDROXYALKYL DERIVATIVES OF AMINOGLYCOSIDE ANTIBIOTICS

Kenneth Richardson; Rhona M. Plews, both of Canterbury, and James R. Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 859,376, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 804,322, Jun. 7, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,409
Claims priority, application United Kingdom, Jun. 16, 1976, 24989/76; Sep. 28, 1976, 40145/76; Dec. 8, 1976, 51294/76
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 536—10 19 Claims

1. A compound of the formula



and the pharmaceutically-acceptable acid addition salts thereof; wherein

$R^2$ is selected from the group consisting of hydroxy and amino;

$R^3$ is selected from the group consisting of hydrogen and hydroxy;

$R^7$ is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms; and

$R^1$ is selected from the group consisting of



and

wherein

$R^8$ is alkyl having from 2 to 5 carbon atoms at least 2 of which bear one hydroxy group;

$R^9$ is alkyl having from 1 to 5 carbon atoms at least one of which bears one hydroxy group; and

$R^{10}$ is alkyl having from 1 to 5 carbon atoms at least one of which bears one hydroxy group.

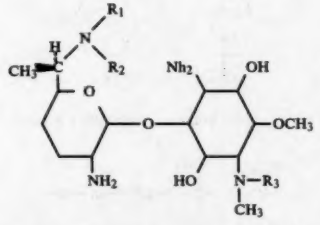
---

## 4,214,075
## 6'-EPI-FORTIMICIN A AND B DERIVATIVES

John S. Tadanier, and Jerry R. Martin, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,004
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 536—17 R 17 Claims

1. A 6'-epi-fortimicins A and B and derivatives of the formula



wherein $R_1$ is hydrogen or lower alkyl, $R_2$ is hydrogen or loweralkyl and $R_3$ is selected from the group consisting of hydrogen, loweralkyl, aminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, hydroxylow-

eralkyl, N-loweralkylaminohydroxyloweralkyl, aminohydroxyloweralkyl, aminoacyl, hydroxylacyl, acyl, N-monoloweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl or an amino acid residue; and the pharmaceutically acceptable salts thereof.

---

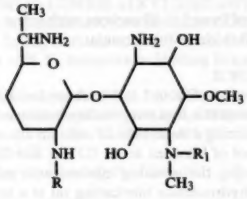
4,214,076

## 2'-N-SUBSTITUTED FORTIMICIN B AND DERIVATIVES

James B. McAlpine, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,013
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R 1 Claim

1. 2'-N-substituted naphthyl Fortimicins B of the formula



(I)

wherein R is β-naphthoyl, γ-naphthoyl, γ-naphthyl; and $R_1$ is acyl, aminoacyl, N-monoloweralkylaminoacyl, N,N-dilower-alkyl-aminoacyl, hydroxy-substituted aminoacyl, an amino acid residue, loweralkyl, aminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, and the pharmaceutically acceptable salts thereof.

---

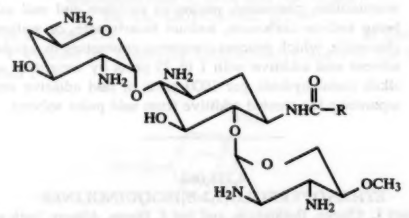
4,214,077

## 1-N-SUBSTITUTED DERIVATIVES OF SELDOMYCIN FACTOR 5

Ronald E. Carney, Gurnee, Ill., and Stephen Hanessian, Beaconsfield, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 21, 1978, Ser. No. 879,415
Int. Cl.[2] C07H 15/22
U.S. Cl. 536—17 R 10 Claims

1. A compound of the formula



wherein R is selected from the group consisting of loweralkyl, aminoloweralkyl, hydroxyloweralkyl, aminohydroxyloweralkyl with the proviso that R cannot be aminohydroxybutyryl and the pharmaceutically acceptable acid addition salts thereof.

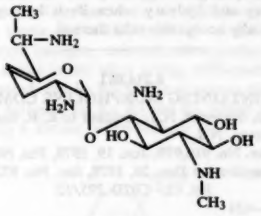
4,214,078

## FORTIMICIN AL

Alma W. Goldstein, Lake Bluff, and Earl E. C. Fager, Lake Villa, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,243
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R 1 Claim

1. Fortimicin AL represented by the formula



or a pharmaceutically acceptable salt thereof.

---

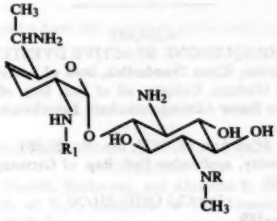
4,214,079

## 4-N, 2'-N AND 4,2'-Di-N-FORTIMICIN AL DERIVATIVES

Jerry R. Martin, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill. and Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,246
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R 10 Claims

1. A fortimicin AL derivative represented by the formula:



wherein: with the limitation that R and $R_1$ each cannot be hydrogen, R and $R_1$ are the same or different members of the group consisting of hydrogen, acyl, aminoacyl, diaminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, loweralkyl, aminoloweralkyl, diaminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl and the pharmaceutically acceptable salts thereof.

---

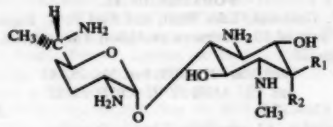
4,214,080

## FORTIMICINS AM AND AP

Ronald E. Carney, Gurnee, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,251
Int. Cl.[2] A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R 3 Claims

1. A compound of the formula



wherein $R_1$ is hydrogen or hydroxy and $R_2$ is hydrogen when $R_1$ is hydroxy and hydroxy when $R_1$ is hydrogen and the pharmaceutically acceptable salts thereof.

---

**4,214,081**

## IMINO CONTAINING MORPHOLINE COMPOUNDS

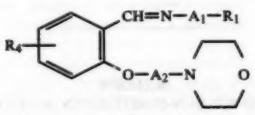
**John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Division of Ser. No. 916,979, Jun. 19, 1978, Pat. No. 4,156,079. This application Dec. 26, 1978, Ser. No. 973,197**

**Int. Cl.[2] C07D *295/12***

**U.S. Cl. 542—424** **4 Claims**

1. A compound having the formula



wherein $R_1$ is alkyl, cycloalkyl or aryl; $R_4$ is alkoxy; $A_1$ is a saturated bond or an alkylene group having 1 to 4 carbon atoms; and $A_2$ is an alkylene group having 2 to 5 carbon atoms; wherein alkyl and alkoxy are groups having 1 to 6 carbon atoms; cycloalkyl is a group having 3 to 7 carbon atoms; and aryl is phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group.

---

**4,214,082**

## ANTHRAQUINONE REACTIVE DYESTUFFS

**Wolfgang Harms; Klaus Wunderlich, both of Leverkusen, and Klaus von Oertzen, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

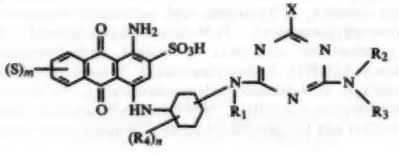
**Filed Apr. 20, 1979, Ser. No. 31,851**

**Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817733**

**Int. Cl.[2] C07D *251/50***

**U.S. Cl. 544—189** **4 Claims**

1. Dyestuffs of the formula



wherein

S=a $SO_3H$, chlorine, bromine, hydroxyl and acetylamino,

m=0, 1 or 2,

X=F, Cl or Br,

$R_1$ and $R_2$=H or optionally substituted $C_1$–$C_4$-alkyl and

$R_3$=optionally substituted phenyl, naphthyl or optionally substituted $C_1$–$C_4$-alkyl, at least one of the radicals $R_2$ or $R_3$ containing at least one group which confers solubility in water.

$R_4$=an optionally substituted $C_1$–$C_4$- alkyl and

n=1, 2, 3 or 4.

**4,214,083**

## PROCESS FOR DECOLORIZING LUBRICATING OIL ADDITIVES

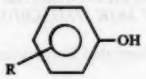
**John M. Larkin, Austin, Tex.; William P. Cullen; Rodney L. Sung, both of Fishkill, N.Y., and Benjamin H. Zoleski, Beacon, N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 757,401, Jan. 6, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 896,840**

**Int. Cl.[2] C07D *473/16, 403/04, 215/10***

**U.S. Cl. 544—277** **4 Claims**

1. A process for decolorizing a lube oil additive of the group of (1) overbased sulfurized calcium alkylphenolates produced by: first, contacting an alkylphenol of the formula:



where R is alkyl of from 5 to 50 carbons with a first addition of calcium alkoxyalkoxide of the formula:

$$Ca(O—A—OR')2$$

where A is alkanediyl of from 1 to 6 carbons and R' is alkyl of from 1 to 25 carbons at a first temperature between about 200° F. and 420° F. utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of between about 0.225:1 and 0.45:1,

second, contacting the resulting mixture with sulfur in the presence of hydrocarbon lubricating oil at a second temperature between about 440° and 460° F. utilizing a mole ratio of sulfur to initial alkylphenol of between about 0.5:1 and 8:1, said hydrocarbon oil in said second contacting constituting between about 13 and 30 wt. % of said reaction mixture and

subsequently, third, contacting the mixture with a second addition of calcium alkoxyalkoxide at said first temperature in a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.15:1 and 0.375:1 in sufficient amount so that the total calcium alkoxyalkoxide employed in the first and third contacting will total a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.5:1 and 0.6:1, and (2) the reaction product of halogenated polyalkylenes having a molecular weight ranging from about 300 to 5000 or copolymers thereof with an excess of an aromatic heterocyclic amine reacted at a temperature of around 80° to 160° C. in the presence of an alkali or alkaline earth metal salt; the amount of heterocycle reacted being in excess of 1.5 to 30 moles per mole of said halogenated polyalkylenes with the amount of said metal being in an amount ranging from 0.2 to 3.0 moles per mole of said polyalkylenes; said polyalkylene being a chlorinated polyalkylene, said heterocyclic amine being pyridine, pico line, methylethylpyridine, quinoline, isoquinoline, phenazine, purine or pyridine and said salt being sodium carbonate, sodium bicarbonate, or sodium gluconate, which process comprises contacting in a polar solvent said additive with 1 to 75 parts by weight of an alkali metal hydride per 1000 parts of said additive and separating the treated additive from said polar solvent.

---

**4,214,084**

## ETHANOPYRROLO[1,2-B]ISOQUINOLINES

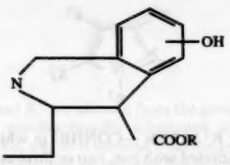
**Robert L. Clarke, Bethlehem, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Division of Ser. No. 894,894, Apr. 10, 1978, Pat. No. 4,179,567. This application May 24, 1979, Ser. No. 41,907**

**Int. Cl.[2] C07D *471/08, 471/18, 451/02*; A61K *31/465***

**U.S. Cl. 546—72** **4 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 3 carbon atoms, and the hydroxy group is in the 6- or 8-position of the pyrrolo[1,2-b]isoquinoline ring; or a pharmaceutically acceptable acid-addition salt thereof.

---

**4,214,085**

## 11-[3-OXO-ω-(2- AND 3-FURYL)-LOWER-ALKYL]HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

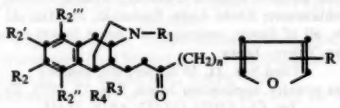
**Thomas R. Lewis, Bethlehem, and William F. Michne, Poestenkill, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 886,781, Mar. 15, 1978, abandoned. This application May 4, 1979, Ser. No. 36,060**

**Int. Cl.[2] C07D *405/06***

**U.S. Cl. 546—97** **5 Claims**

1. A compound having the formula



where R is hydrogen or lower-alkyl; $R_1$ is hydrogen, lower-alkyl, cyclo-lower-alkyl-lower-alkyl, phenyl-lower-alkyl, lower-alkenyl or lower-alkynyl; $R_2$, $R_2'$, $R_2''$ and $R_2'''$ are each hydrogen, or three of them are hydrogen and the fourth is hydroxy, methoxymethoxy, lower-alkoxy or 2-tetrahydropyranyloxy; $R_3$ and $R_4$ are each hydrogen or lower-alkyl, or $R_3$ and $R_4$ together are divalent lower-alkylene, $—(CH_2)_m—$, where m is one of the integers 3 and 4; and n is 0 or the integers 1 or 2; or an acid-addition salt thereof.

---

**4,214,086**

## PROCESS FOR PRODUCING HYDROXYDIARYL ETHERS

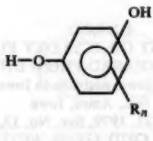
**Hansjakob Fäh, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 848,671, Nov. 4, 1977, abandoned. This application May 9, 1979, Ser. No. 37,561**

**Int. Cl.[2] C07D *213/63, 213/64***

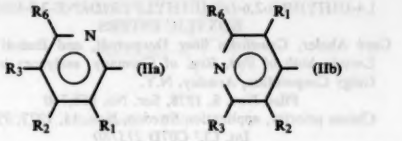
**U.S. Cl. 546—290** **12 Claims**

1. Process for producing hydroxydiaryl ethers of the formula I



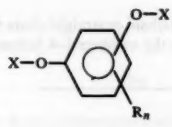
(I)

wherein R represents an alkyl group having 1 to 4 carbon atoms or chlorine, n represents 0, 1, 2, 3 or 4, and X represents a 2-pyridinyl group of the formula IIa or a 4-pyridinyl group of the formula IIb



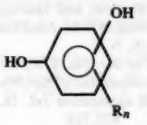
(IIa) (IIb)

wherein $R_1$, $R_2$ and $R_3$ each represent hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkyl group which has 1 to 4 carbon atoms and which is mono- or disubstituted by halogen, phenyl, halogen, carboxyl, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl group, trifluoromethyl, nitro, cyano or benzoyl, and $R_6$ has all the meanings given, with the exception of halogen, for $R_1$, $R_2$ and $R_3$, which process comprises reacting a diether of the formula III



(III)

wherein R, n and X having the meanings given under the formula I, in a polar aprotic solvent, in the presence of 0.1 to 1 mole of alkali per mole of diether of the formula III, with a dihydroxybenzene of the formula IV



(IV)

wherein R and n have the meanings given under the formula I.

---

**4,214,087**

## PRODUCTION OF CARBOXYLIC ACIDS FROM NITRILES

**Anthony J. Fanelli, Rockaway, and Abraham P. Gelbein, Plainfield, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.**

**Filed Dec. 13, 1978, Ser. No. 968,757**

**Int. Cl.[2] C07C *63/24, 63/26*; C07D *213/55***

**U.S. Cl. 546—319** **14 Claims**

1. In a process for hydrolizing a nitrile to the corresponding carboxylic acid, the improvement comprising:

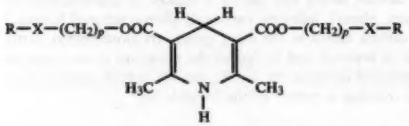
effecting said hydrolysis by reacting steam and a nitrile selected from the group consisting of (1) pyridine substituted with from 1 to 2 cyano groups and (2) aromatic nitriles having from 1 to 2 cyano groups substituted on an aromatic nucleus selected from the group consisting of benzene and naphthalene, and intermediate hydrolysis products of (1) and (2), in the vapor phase, in the presence of an acid catalyst in solid form selected from the group consisting of silica gel, silica-alumina, supported phosphoric acid, group III metal phosphates, Group III metal sulfates and transition metal oxides at a temperature which is above the dew point of both the nitrile and corresponding carboxylic acid; and stripping ammonia evolved in said hydrolysis and absorbed by the catalyst from said catalyst to increase the product ratio of carboxylic acid product to amide byproduct.

## 4,214,088
## 1,4-DIHYDRO-2,6-DIMETHYLPYRIDENE-3,5-DICARBOXYLIC ESTERS

Gerd Abeler, Griesheim über Darmstadt, and Rudolf Maul, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 8, 1978, Ser. No. 958,760
Claims priority, application Sweden, Nov. 11, 1977, 7713799
Int. Cl.[2] C07D *213/80*
U.S. Cl. 546—321 4 Claims

1. A stabiliser of the formula I



(I)

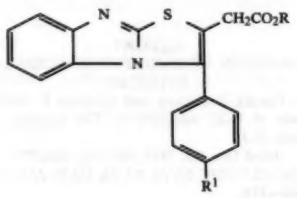
in which R is branched-chain or straight-chain $C_1$–$C_{20}$ alkyl, X is sulfur and p denotes the numbers 1–4 inclusive.

## 4,214,089
## THIAZOLO[3,2-A]BENZIMIDAZOLES, IMIDAZO[2,1-B]THIAZOLES, AND RELATED COMPOUNDS AS ANTINEOPLASTIC AGENTS, AND ENHANCERS OF THE IMMUNE RESPONSE

Richard L. Fenichel, Wyncote; Peter H. L. Wei, Springfield; Francis J. Gregory, Berwyn, and Harvey E. Alburn, West Chester, all of Pa., assignors to America Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 679,941, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 523,763, Nov. 14, 1974, abandoned. This application Jul. 18, 1978, Ser. No. 925,728
Int. Cl.[2] C07D *277/24*
U.S. Cl. 548—151 2 Claims

1. A chemical compound having the structure:



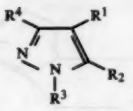
wherein R is hydrogen or lower alkyl of from 1 to 4 carbon atoms; and $R^1$ is chloro; and the pharmaceutically acceptable salts thereof.

## 4,214,090
## FUNGICIDAL CARBOXAMIDOPYRAZOLES

John L. Huppatz, Weetan gera, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Austria

Division of Ser. No. 756,069, Jan. 3, 1977, Pat. No. 4,134,987. This application Oct. 13, 1978, Ser. No. 951,376
Claims priority, application Australia, Jan. 14, 1976, PC 4527
Int. Cl.[2] C07D *231/16, 231/14*
U.S. Cl. 548—377 11 Claims

1. A compound of the formula

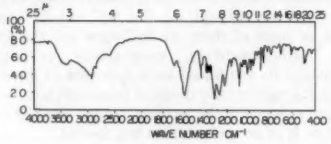


wherein either $R^1$ or $R^2$ is —CONHR[5] in which $R^5$ is phenyl optionally substituted with one, two or three substituents independently chosen from the group consisting of $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy, halogen, trifluoromethyl, nitro and cyano; $R^3$ is chosen from the group consisting of hydrogen, $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ hydroxyalkyl, phenyl and —$CH_2COOR^6$ wherein $R^6$ is $C_1$ to $C_4$ alkyl; $R^4$ and $R^1$ or $R^2$, whichever is not —CONHR[5], are independently chosen from the group consisting of hydrogen, halogen and $C_1$ to $C_4$ alkyl; $R^2$ and $R^4$ are not both hydrogen when $R^1$ is —CONHR[5]; $R^1$ and $R^3$ are not both hydrogen when $R^2$ is —CONHR[5]; $R^2$, $R_3$ and $R^4$ are not each methyl when $R^1$ is —CONHR[5] and $R^5$ is phenyl; and $R^1$ and $R^3$ are not both methyl when $R^4$ is hydrogen and $R^2$ is —CONHR[5] and $R^5$ is phenyl.

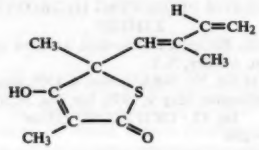
## 4,214,091
## ANTIBIOTIC NO. 2-200 AND PROCESS FOR PRODUCING THEREOF

Hideo Oishi, Sayama; Takao Noto, Machida; Yoshiharu Nawata, Kodaira; Hiroshi Okazaki, Sayama; Hiroshi Sasaki, Higashikurume; Kunio Ando, Kawasaki, and Haruki Ogawa, Chofu, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1978, Ser. No. 944,303
Claims priority, application Japan, Sep. 22, 1977, 52-113205
Int. Cl.[2] C07D *333/32;* A61K *31/38*
U.S. Cl. 549—62 1 Claim




1. An antibiotic No. 2-200 of the formula:

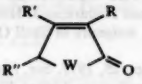


## 4,214,092
## REARRANGEMENT OF ACYLOXY FURANS AND THIOPHENES PREPARED FROM BUTENOLIDES

George A. Kraus, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 21, 1979, Ser. No. 13,519
Int. Cl.[2] C07D *333/16, 307/12*
U.S. Cl. 549—64 9 Claims

1. A method of preparing rearranged acyloxy furans and thiophenes from butenolides, comprising:
reacting a butenolide of the formula:



wherein R, R′ and R″ are selected from the group consisting of hydrogen and non-functionally substituted alkyls, alkenyls, alkynyls and aryls, and W is selected from the group consisting of oxygen and sulfur with an acid and halide acylating agent of the formula:

wherein R‴ is selected from the same group as R, R′ and R″ and X is a halide said reaction being conducted in an inert atmosphere and in the presence of a strong organic base and a suitable organic solvent for said base to provide an acylated furan ring containing intermediate;

separating said intermediate from other reaction materials; and thereafter

reacting said acylated furan ring containing intermediate, in the presence of at least a catalytically effective amount of a lewis acid in an anhydrous solvent to provide a rearranged acyloxy furan or thiophene analog thereof.

---

**4,214,093**

## AMINO- OR GUANIDINO-1,2,3,4-TETRAHYDRO-1-NAPHTHOIC ESTERS

**Setsuro Fujii, Toyonaka; Yojiro Sakurai, Kamakura; Toyoo Nakayama, and Ryoji Matsui, both of Funabashi, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan**

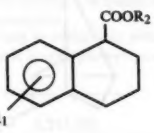
**Continuation-in-part of Ser. No. 953,735, Oct. 23, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,594**

**Claims priority, application Japan, Oct. 27, 1977, 52-128874; Oct. 27, 1977, 52-128875**

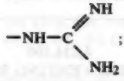
**Int. Cl.[2] C07C *101/48;* A61K *31/24***

**U.S. Cl. 560—34** **12 Claims**

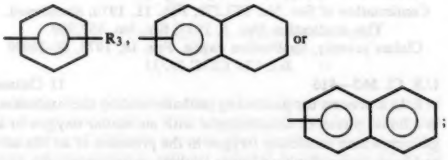
1. An amino- or guanidino-1,2,3,4-tetrahydro-1-naphthoic ester represented by the formula,



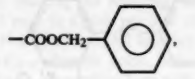
wherein $R_1$ is $-NH_2$ or



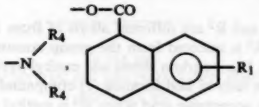
$R_2$ is



$R_3$ is —H, —$R_4$, —O—$R_4$, —COOH, —$COOR_4$,



—$NHCOCH_3$, a halogen, —CN,



or —$(CH_2)_n$—$COOCH_2$—CO—$R_5$; $R_4$ is a lower alkyl group; $R_5$ is —O—$R_4$, —$NH_2$or

and n is 0, 1 or 2; or a pharmaceutically acceptable acid addition salt of said ester.

---

**4,214,094**

## SUBSTITUTED-PHENYL SUBSTITUTED-ALKYL ETHERS AND THE PREPARATION THEREOF

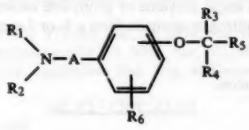
**Takashi Kamiya, Suita, and Yoshihisa Saito, Takarazuka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 583,474, Jun. 3, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 782,967**

**Int. Cl.[2] C07C *101/72;* A61K *31/24***

**U.S. Cl. 560—42** **45 Claims**

1. Substituted-phenyl substituted-alkyl ether of the formula:



wherein

$R_1$ is aryl or ar(lower)alkyl;

$R_2$ is hydrogen, lower alkyl, aryl or ar(lower)alkyl;

$R_3$ is lower alkyl;

$R_4$ is hydrogen or lower alkyl;

$R_5$ is carboxy or lower alkoxycarbonyl;

$R_6$ is hydrogen, hydroxy or lower alkoxy; and

A is lower alkylene; in which the aryl or the ar(lower)alkyl for $R_1$ and $R_2$ may be substituted with halogen, hydroxy or lower alkoxy; and pharmaceutically acceptable salts thereof.

---

**4,214,095**

## CHLOROBENZYL PHENOXY ALKOXYLATES

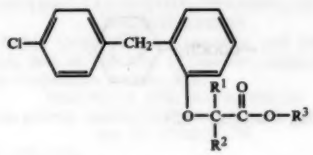
**Kurt Thiele; Quazi Ahmed, both of Zofingen; Rudolf Adrian, Vordemwald, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland**

**Filed Jan. 25, 1979, Ser. No. 6,542**

**Int. Cl.[2] C07C *69/76***

**U.S. Cl. 560—57** **6 Claims**

1. A compound of the formula (I)



(1)

wherein $R^1$ and $R^2$ are different alkyls of from 1 to 4 carbon atoms and $R^3$ is selected from the group consisting of alkyls having from 1 to 4 carbon atoms and methyl pyridine; and the acid addition salts of said formula (1) compound with a pharmaceutically acceptable acid when $R^3$ is methyl pyridine.

---

**4,214,096**

**NOVEL ISOTHIOURONIUM SALTS**

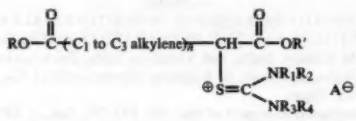
**Thomas C. Klingler; Ritchie A. Wessling, and Dale S. Gibbs, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 569,416, Apr. 18, 1975, abandoned. This application Jun. 15, 1979, Ser. No. 48,954**

**Int. Cl.[2] C07C** *157/02, 157/05, 161/00*

**U.S. Cl. 560—147** **8 Claims**

1. A surfactant corresponding to the formula



wherein:

R and R′ are each independently alkyl or alkaryl groups of from about 4 to about 20 carbon atoms;

$R_1$, $R_2$, $R_3$ and $R_4$ are each independently alkyl or hydroxyalkyl of from 1 to 4 carbon atoms, allyl or $R_1$ and $R_3$ are part of a single ethylene or propylene moiety which joins the two nitrogen atoms to form a 5- or 6-membered cyclic thiourea;

n is 0 or 1;

$A^{\ominus}$ is an anion.

---

**4,214,097**

**PROCESS FOR PREPARING DIHALOVINYLCYCLOPROPANECARBOXYLATES**

**Kiyoshi Kondo; Kiyohide Matsui; Akira Negishi, all of Kanagawa, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan**

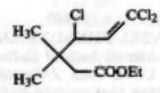
**Division of Ser. No. 606,807, Aug. 22, 1975. This application Jan. 20, 1978, Ser. No. 870,974**

**Claims priority, application Japan, Feb. 24, 1975, 50/21857**

**Int. Cl.[2] C07C** *69/65*

**U.S. Cl. 560—213** **1 Claim**

1. A process for preparing the compound



which comprises dehydrohalogenating ethyl 4,6,6,6-tetrachloro-3,3-dimethylhexanoate in dimethylformamide with sodium ethoxide at a temperature between about 50° and 150° C. to eliminate one mole of HCl and produce said compound.

**4,214,098**

**UNSATURATED ALCOHOLS AND ESTERS**

**Aaldert J. de Jong, and Hendricus J. Heijmen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

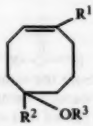
**Filed Oct. 25, 1977, Ser. No. 844,956**

**Claims priority, application United Kingdom, Nov. 1, 1976, 45309/76**

**Int. Cl.[2] C07C** *35/20, 69/145*

**U.S. Cl. 560—231** **6 Claims**

1. A cyclooctene derivative of the formula:



in which $R^1$ and $R^2$ each represents an alkyl group of 1 to 4 carbon atoms and $R^3$ represents a hydrogen atom or an acyl group of 1 to 4 carbon atoms.

---

**4,214,099**

**INTERMEDIATES FOR SYNTHESIS OF PRECURSORS FOR PROSTAGLANDINS**

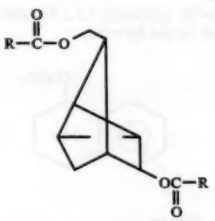
**Elias J. Corey, Cambridge, Mass.; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.**

**Division of Ser. No. 787,593, Apr. 14, 1977, Pat. No. 4,122,093, which is a division of Ser. No. 720,239, Sep. 3, 1976, abandoned, which is a division of Ser. No. 633,222, Nov. 19, 1975, Pat. No. 3,992,438, which is a division of Ser. No. 409,068, Oct. 24, 1973, Pat. No. 3,943,151. This application Jun. 22, 1978, Ser. No. 917,855**

**Int. Cl.[2] C07C** *69/08, 69/16, 69/28*

**U.S. Cl. 560—256** **1 Claim**

1. A compound of the structure:



wherein R is hydrogen or lower alkyl.

---

**4,214,100**

**PROCESS FOR PREVENTING BLACKENING OF PHTHALIC ACID**

**Makoto Komatsu; Tazuo Ohta; Toru Tanaka, and Kimiko Akagi, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Continuation of Ser. No. 657,279, Feb. 11, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,709**

**Claims priority, application Japan, Feb. 18, 1975, 50-20090**

**Int. Cl.[2] C07C** *51/33*

**U.S. Cl. 562—416** **11 Claims**

1. In a process for producing phthalic acid by the oxidation, in a liquid phase, of tolualdehyde with molecular oxygen or a gas containing molecular oxygen in the presence of an Mn salt and bromine employing a lower aliphatic monocarboxylic acid as a solvent, the improvement comprising conducting the

oxidation of the tolualdehyde in the presence of an alkylbenzene in an amount satisfying the formula

$$M \leq -0.15A^2 + 15A + 40$$

wherein M is the Mn atom concentration in ppm by weight on the basis of the reaction solution, said reaction solution being the total of solvent and water present in the reaction system, and A is an amount in % by weight of the alkylbenzene added based on the total amount of the tolualdehyde and the alkylbenzene and is in a range of from more than 0 to 50 inclusive.

---

**4,214,101**

## PROCESS FOR PREPARING ETHER CARBOXYLATES

**Bunji Miya, and Akio Kimura, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan**

**Filed Apr. 13, 1978, Ser. No. 896,088**
**Claims priority, application Japan, May 16, 1977, 52-56205**
**Int. Cl.² C07C *51/24, 59/00***
**U.S. Cl. 562—421** **8 Claims**

1. A process for preparing an ether carboxylate, which comprises the steps of: intimately contacting, at a temperature of 50° to 95° C., oxygen gas with a liquid reaction mixture consisting essentially of a material selected from the group consisting of

(a) a compound or mixture of compounds having the formula

$$RO(CH_2CH_2O)_nH$$

wherein R is octylphenyl, nonylphenyl, dodecylphenyl or alkyl having 8 to 22 carbon atoms, and n is an integer of from 1 to 100,

(b) oxyethylene-oxypropylene block copolymer having an average molecular weight of from 1000 to 12000 and containing from 10 to 80% by weight of ethylene oxide units, and mixtures thereof,

dissolved or dispersed in water, said reaction mixture containing from 0.5 to 10% by weight of catalyst based on the weight of said material, said catalyst being composed of an inactive carrier having from 1 to 10% by weight of palladium supported on said carrier, said reaction mixture also containing caustic alkali so that said reaction mixture has a pH of from 8 to 13, the oxygen gas being contacted with said reaction mixture for a period of time effective to transform said material to the corresponding carboxylate.

4. A process according to claim 1 in which said material is component (a) wherein R is octylphenyl, nonylphenyl or dodecylphenyl.

---

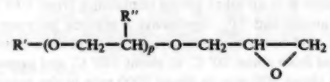
**4,214,102**

## AMINO-ETHER AMPHOTERIC SURFACE-ACTIVE COMPOUNDS

**Peter Leenders, Allendale, N.J., assignor to Henkel Inc., Hoboken, N.J.**

**Filed Apr. 14, 1978, Ser. No. 896,294**
**Int. Cl.² C07C *143/14, 101/30*; C11D *1/18, 3/30***
**U.S. Cl. 562—564** **4 Claims**

1. An amino-ether amphoteric surface-active compound mixture produced by reacting a glycidyl ether having the formula



wherein R'' is a member selected from the group consisting of hydrogen and methyl; R' is a member selected from the group consisting of aliphatic primary alkyl having from 8 to 22 carbon atoms, aliphatic primary alkenyl having from 12 to 20 carbon atoms and 2-alkylalkanols having from 10 to 36 carbon atoms; and p is an integer from 0 to 3; with a substantial excess of an N-hydroxy-$C_{2-4}$-alkyl-$C_{2-6}$-alkylene diamine, removing the excess diamine, reacting the resulting substituted amino-ether with from 1.5 mols to 4 mols per mol of said substituted amino-ether of an N-alkylating agent selected from the group consisting of halo-$C_{2-4}$-alkanoic acids, halo-$C_{2-4}$-alkane sulfonic acids and halo-$C_{3-4}$-hydroxyalkane sulfonic acids, under alkaline reaction conditions maintained by the addition of an alkali metal hydroxide solution, and recovering said amino-ether amphoteric surface-actice compound mixture.

---

**4,214,103**

## PURIFICATION OF BROMINATED ORGANIC PRODUCTS

**John A. Garman, and Rastko I. Mamuzic, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.**

**Filed Nov. 30, 1978, Ser. No. 965,091**
**Int. Cl.² C07C *41/12***
**U.S. Cl. 568—639** **14 Claims**

1. A process, for purifying a member selected from the group consisting of partially brominated diphenyl ethers, mixtures thereof, and blends thereof with other materials comprising the steps of:

dissolving the member in an organic solvent and maintaining the resulting solution at an elevated temperature below the reflux temperature of the solution while substantially excluding water from the solution;

adding a finely divided basic solid to the solution and agitating for a time sufficient to enhance the purity of the product;

thereafter filtering the solution; and

thereafter stripping the solvent therefrom.

---

**4,214,104**

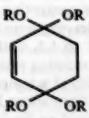
## USE OF CYCLOHEXENE-(1)-DIONE-(3,6)-TETRAALKYL DIKETALS

**Rudolf Pistorius, Ober-Mörlen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Division of Ser. No. 872,450, Jan. 26, 1978, Pat. No. 4,160,109. This application Oct. 31, 1978, Ser. No. 956,332**
**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703453**
**Int. Cl.² C07C *41/00***
**U.S. Cl. 568—648** **4 Claims**

1. A method for the preparation of a hydroquinone dialkyl ether of the formula

wherein R is a primary or secondary alkyl radical of from 1 to 4 carbon atoms, which comprises acidifying and heating, to a temperature of from about 60° to 120° C., a cyclohexene-(1)-dione-(3,6)-tetraalkyl diketal of the formula



## 4,214,105
## PROCESS FOR THE HYDROXYLATION OF PHENOL

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 731,889, Oct. 13, 1976, which is a continuation of Ser. No. 554,048, Feb. 28, 1975, Pat. No. 4,053,523. This application Sep. 15, 1978, Ser. No. 942,717

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1974, 2410742

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.² C07C *37/00, 39/08*

U.S. Cl. 568—771 14 Claims

1. A process for preparing pyrocatechol and hydroquinone wherein phenol is reacted at the start of the reaction with substantially anhydrous hydrogen peroxide dissolved in a non-aqueous solvent in an amount of 5 to 30 weight percent, said hydrogen peroxide having been obtained by distilling off water from an aqueous solution of hydrogen peroxide while the same is in admixture with a non-aqueous organic solvent which solvent boils at a higher temperature than phenol to leave behind as the bottoms product of the distillation a substantially anhydrous hydrogen peroxide dissolved in said non-aqueous organic solvent, the reaction being carried out in the presence of a strong acid at a temperature of 20°–150° C. in a reaction mixture consisting essentially of said hydrogen peroxide, said solvent, said phenol and said strong acid and wherein pyrocataechol and hydroquinone are recovered.

## 4,214,106
## PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

Dieter Freudenberger, Hofheim am Taunus, and Friedrich Wunder, Flörsheim am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,823

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715666

Int. Cl.² C07C *31/20*

U.S. Cl. 568—864 12 Claims

1. A process for the preparation of ethylene glycol from glycolic acid, which comprises reacting a solution consisting essentially of glycolic acid, or, glycolic acid and a solvent selected from the group consisting of cyclic ethers, open-chain ethers and water, with hydrogen in the presence of a hydrogenation catalyst which consists essentially of a platinum metal of group VIII and/or a compound thereof in admixture with either

1. an element of group VIIb and/or a compound thereof, or
2. gold or silver and/or a compound thereof, or
3. an element of group VIIb and/or a compound thereof as well as gold or silver and/or a compound thereof.

## 4,214,107
## HYDRATION OF OLEFINS USING ZEOLITE CATALYSTS

Clarence D. Chang, Princeton, and Norman J. Morgan, Burlington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,194

Int. Cl.² C07C *29/04*

U.S. Cl. 568—897 1 Claim

1. A process for directly hydrating propylene to isopropyl alcohol, which comprises contacting a mixture of propylene and water, said mixture having a mole ratio of propylene to water in the range of 0.5 to 1.5, with a synthetic crystalline aluminosilicate catalyst consisting essentially of HZSM-5, said contacting being conducted at a temperature of about 100° to about 240° C., a pressure from about 50 p.s.i.g. to 1500 p.s.i.g, and at a space velocity based on liquid olefin of about 0.25 to 10 LHSV, whereby directly forming isopropyl alcohol substantially free of ether and hydrocarbon by-product.

## 4,214,108
## 1,5,9-CYCLODODECATRIENE FROM BUTADIENE TRIMERIZATION USING DIBENZYLBENZENES

Wolfgang Zaar, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

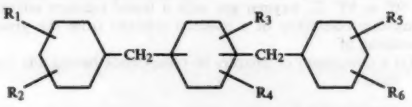
Filed Jun. 4, 1979, Ser. No. 45,287

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825341

Int. Cl.² C07C *3/60, 13/02*

U.S. Cl. 585—23 6 Claims

1. In the method for producing cyclododecatri(1,5,9)enes by catalytically trimerizing butadienes on a catalyst of titanium halide and alkylaluminum halide in the presence of hydrocarbons or halogenated hydrocarbons, the improvement comprising: carrying out the reaction in the presence of dibenzylbenzenes having the general formula:




where $R_1$ through $R_6$ represent hydrogen atoms, halogen atoms, alkyl groups, aralkyl groups, cycloalkyl groups or aryl groups, the dibenzylbenzenes being used in at least equimolar amounts with respect to the titanium compound.

## 4,214,109
## POLYMER BOUND (PENTAHAPTOCYCLOPENTADIENYL)BISCARBONYL RHODIUM HYDROFORMYLATION CATALYST

John T. Carlock, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

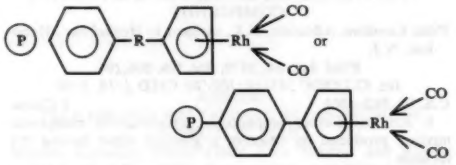
Division of Ser. No. 877,440, Feb. 13, 1978. This application Jan. 29, 1979, Ser. No. 7,085

Int. Cl.² C07C *29/16*

U.S. Cl. 568—909 2 Claims

1. A method for the conversion of olefins to alcohols comprising:

(a) converting olefins to aldehydes by a hydroformylation reaction in the presence of a catalyst having the structure




wherein R is an alkyl group containing from 1 to 10 carbon atoms and Ⓟ represents a styrene polymer backbone, said conversion occurring taking place at a temperature of from about 90° C. to about 140° C. and pressures of from about 300 psig to about 5000 psig in the presence of mixture of hydrogen and carbon monoxide;

(b) purging the reactor of the mixture of hydrogen and carbon monoxide and replacing with hydrogen, and;

(c) converting the aldehydes formed in (a) to alcohols at pressures of about 100 psig to 3000 psig and temperatures of from about 20° C. to about 140° C.

4,214,110

## PROCESS FOR PRODUCING HYDROCARBONS

Tatsuo Moroe, Musashino; Akira Komatsu, Tokyo; Kiyosumi Doi, Fujisawa, and Mitio Moroe, Musashino, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 523,782, Nov. 13, 1974, abandoned. This application Jul. 23, 1976, Ser. No. 708,246

Claims priority, application Japan, Nov. 15, 1973, 48-128650

Int. Cl.[2] C07C 3/26

U.S. Cl. 585—241 2 Claims

1. A process for producing a hydrocarbon product consisting essentially of hydrocarbons having about 10 to 50 carbon atoms with 60% or more of said product consisting of hydrocarbons containing 25 to 35 carbon atoms which comprises subjecting a synthetic polyisoprene rubber having 92 to 97% cis-type double bonds to a thermally destructive distillation at about 300 to 400° C for about 30 minutes under a reduced pressure of about 0.1 to 5 mm. Hg. to obtain said hydrocarbon product consisting essentially of hydrocarbons having about 10 to 50 carbon atoms with 60% or more of said product consisting of hydrocarbons containing 25 to 35 carbon atoms, said hydrocarbon product not having a bad odor and containing scarcely any resinous material.

---

4,214,111

## METHOD OF PRODUCING OLEFIN OLIGOMERS AND HYDROGENATION PRODUCTS THEREOF

Takanori Kitamura, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Nov. 6, 1978, Ser. No. 958,144

Claims priority, application Japan, Nov. 8, 1977, 52/134481; Sep. 4, 1978, 53/108853

Int. Cl.[2] C07C 3/18, 5/04

U.S. Cl. 585—255 14 Claims

1. A method of producing an olefin oligomer, which comprises feeding to the polymerization system (i) at least one alpha-olefin having a terminal vinyl group and containing 6 to 14 carbon atoms, (ii) isobutylene and/or diisobutylene, and optionally (iii) 1-butene so that the conditions

$$0.25 \leqq \frac{b + 2c + d}{a} \leqq 4,$$

$$0 \leqq \frac{d}{b + 2c} \leqq 2.5 \text{ and}$$

$$0 \leqq \frac{d}{a} \leqq 2.5$$

wherein a is the number of moles of the alpha-olefin having a terminal vinyl group and containing 6 to 14 carbon atoms as fed to the polymerization system, b is the number of moles of isobutylene as fed to the polymerization system, c is the number of moles of diisobutylene as fed to the polymerization system and d is the number of moles of 1-butene as fed to the polymerization system, may be satisfied, while carrying out the polymerization in the presence of an aluminum halide catalyst.

---

4,214,112

## PROCESS FOR PREPARING OLEFIN OLIGOMER

Hiroshi Mandai, Chiba; Anri Tominaga, Funabashi; Yoshikazu Yoshimura, Chiba, and Hiroshi Isa, Yachiyo, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1979, Ser. No. 24,205

Claims priority, application Japan, Mar. 27, 1978, 53-35231

Int. Cl.[2] C07C 3/18

U.S. Cl. 585—532 9 Claims

1. A process for producing an olefin oligomer comprising polymerizing at least one olefin having not less than 6 carbon atoms in the presence of a catalyst consisting essentially of (a) at least one aluminum halide, (b) at least one polyhydric alcohol derivative of which alcohol the hydrogen atoms of the entire hydroxyl groups are substituted with either one or both of alkyl and acyl groups and (c) at least one compound selected from the group consisting of nickel compounds and cobalt compounds.

---

4,214,113

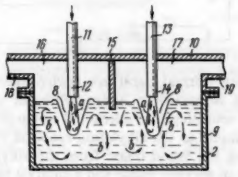
## METHOD FOR CARRYING OUT PYROLYSIS OF HYDROCARBON STARTING PRODUCTS

Elena D. Khmelevskaya, Yaroslavskoe shosse, 142, kv. 106, Moscow; Grigory I. Dvoskin, Mytischi, Sharapovsky proezd, 18, kv. 4, Moskovskaya oblast; Vladislav A. Kablikov, Sretensky bulvar, 6/1, kv. 122, Moscow; Zinovy F. Chukhanov, ulitsa D. Ulyanova, 3, kv. 40, Moscow; Vadim M. Volny, ulitsa Butlerova, 34, korpus 1, kv. 29, Moscow; Tamara N. Mukhina, Festivalnaya ulitsa, 15, korpus 3, kv. 44, Moscow; Genrikh L. Stolyar, Kievskaya ulitsa, 18, kv. 51, Moscow; Olga E. Volnaya, ulitsa Butlerova, 34, korpus 1, kv. 29, Moscow, and Nikolai F. Kuptsov, ulitsa Shafeeva, 18, kv. 25, Ufa, all of U.S.S.R.

Division of Ser. No. 811,137, Jun. 28, 1977. This application Dec. 6, 1978, Ser. No. 966,781

Int. Cl.[2] C07C 3/30

U.S. Cl. 585—634 3 Claims




1. In a method for carrying out pyrolysis of hydrocarbon starting products utilizing a casing having a substantially cylindrical side wall and a liquid heat carrier disposed therein said liquid heat carrier being at a predetermined level in said casing and defining a space above the surface of said liquid heat carrier, a substantially cylindrical baffle located within said casing substantially coaxially with respect to said cylindrical wall and dividing said space into a heating zone and a pyrolysis zone, said baffle extending a small distance below the surface of said heat carrier, the insulation comprising the steps of:

directing a jet of gaseous heating agent onto the surface of the heat carrier in the heating zone;

directing a jet of hydrocarbon starting products onto the surface of the heat carrier in the pyrolysis zone so than an intensive heat transfer occurs from the heat carrier to the hydrocarbon starting products which contact the surface of the heat carrier whereby pyrolysis products are formed; and

removing the pyrolysis products from said casing.

---

4,214,114

## ISOPARAFFIN-OLEFIN ALKYLATION UTILIZING EVAPORATIVE COOLING IN A REACTOR-DEPROPANIZER

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 26, 1979, Ser. No. 7,120

Int. Cl.[2] C07C 3/54

U.S. Cl. 585—715 12 Claims

1. An alkylation process which comprises:

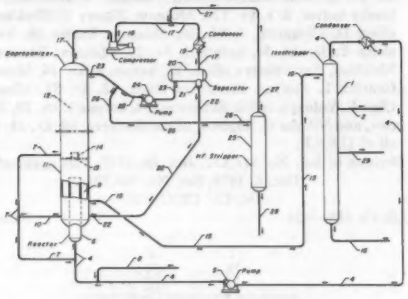
(a) introducing upwardly into an alkylation reaction zone maintained under alkylation reaction conditions including liquid phase alkylation, an alkylation reaction mixture comprising an isoparaffinic hydrocarbon, a lower boiling normal paraffinic hydrocarbon, an olefinic hydrocarbon and an acid alkylation catalyst;

(b) reacting the olefinic hydrocarbon with a portion of said isoparaffinic hydrocarbon in said zone;

(c) vaporizing from the liquid reaction mixture of said zone

by the exothermic heat of reaction, a sufficient quantity of unreacted isoparaffinic and normal paraffinic hydrocarbons to provide an adequate evaporative cooling effect to maintain the reaction mixture in said zone at a temperature of from about 30° to about 100° F. without extraneous cooling;

(d) passing the resultant vapors from said liquid phase in the reaction zone upwardly into a separation zone in open communication with said reaction zone;



(e) separating normal paraffinic hydrocarbon vapor from unreacted isoparaffinic hydrocarbon in said separation zone and returning said unreacted isoparaffinic hydrocarbon as a liquid to the alkylation reaction zone; and

(f) separating the liquid phase from the alkylation reaction zone into an alkylate phase and a catalyst phase, recycling the separated catalytic phase to said alkylation reaction zone and recovering the alkylate product from said alkylate phase.

---

**4,214,115**

## ALKYLATION PROCESS UTILIZING PLURAL OLEFINIC REACTANTS

**Donald J. Makovec, and Thomas Hutson, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed May 9, 1978, Ser. No. 904,149**
**Int. Cl.[2] C07C *3/54***
**U.S. Cl. 585—716** **6 Claims**

1. A process for producing an alkylation reaction product from an isoparaffinic reactant and two different olefinic reactants which comprises:

passing the isoparaffin reactant and a first olefinic reactant in admixture with an acid alkylation catalyst through an alkylation zone under alkylating conditions to form a first alkylate stream,

separating said first alkylate stream into a first hydrocarbon phase comprising alkylation products and unreacted isoparaffin and an acid alkylation catalyst phase,

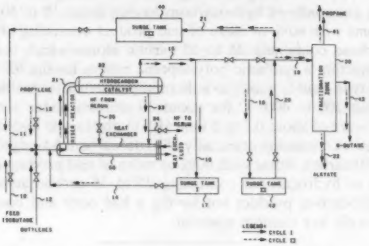
passing said first hydrocarbon phase to a first surge zone,

passing a second olefinic reactant and said first hydrocarbon phase in said first surge zone in admixture with an acid alkylation catalyst through said alkylation zone under alkylating conditions to form a second alkylate stream,

separating said second alkylate stream into a second hydrocarbon phase comprising alkylation products unreacted isoparaffin and an acid alkylation catalyst phase,

passing a first portion of said second hydrocarbon phase to a fractionation zone and a second portion of said second hydrocarbon phase to a second surge zone,

passing the accumulated hydrocarbon liquid held in the second surge zone to the fractionation zone after said first



portion of second hydrocarbon phase has been fractionated and said alkylation zone has returned to the cycle of passing said first olefinic reactant and isoparaffin through the alkylation zone to form said first alkylation stream,

recovering alkylate product from said fractionation zone, and

continuously recycling separated acid alkylation catalyst phase to the alkylation zone with appropriate heating or cooling of said catalyst phase thereby obtaining optimum temperature in the particular alkylation reaction based on said first or said second olefinic reactant.

---

**4,214,116**

## HYDROCARBON ISOMERIZATION UTILIZING A HYDROCARBON PROMOTER WITH TANTALUM PENTAFLUORIDE AND HYDROGEN HALIDE CATALYST

**David A. McCaulay, Homewood, and Thomas D. Nevitt, Naperville, both of Ill., assignors to Standard Oil Co. (Indiana), Chicago, Ill.**

**Filed Jun. 11, 1979, Ser. No. 47,060**
**Int. Cl.[2] C07C *5/28***
**U.S. Cl. 585—747** **9 Claims**

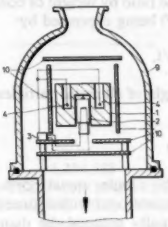
1. An isomerization process which comprises isomerizing a hydrocarbon stream comprising at least one saturated $C_5$–$C_6$ hydrocarbon in the presence of hydrogen and a catalyst comprising tantalum pentafluoride and hydrogen halide and in the presence of a hydrocarbon promoter comprising at least one member selected from the group consisting of $C_8$–$C_{14}$ multiple-branched paraffins, wherein the total concentration of $C_8$–$C_{14}$ multiple-branched paraffins is in the range of about 1 to 50 parts by weight per 100 parts by weight of said saturated $C_5$–$C_6$ hydrocarbons.

4,214,117

## FURNACE HEATED BY RADIATION

Günter Hentze, Odenthal-Hahnenberg, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,886
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704870
Int. Cl.² E01D *15/00*
U.S. Cl. 13—31 R 2 Claims



1. A furnace for analytical measurements comprising:
(a) a radiation source comprising an incandescent lamp,
(b) a hollow cylinder composed of one from the group of metal, graphite and ceramic material spaced apart from and surrounding the incandescent lamp for absorbing the radiation emitted therefrom,
(c) temperature sensing means attached to the outside of the hollow cylinder for monitoring the temperature at its surface,
(d) a regulatable power supply connected to the incandescent lamp and to the temperature sensing means and regulated in response to the monitored temperature,
(e) a container enclosing the lamp, cylinder and temperature sensing means with an inert atmosphere therein, and
(f) the overall heat capacity of the furnace is in the range of 0.5–10 cal/° C.

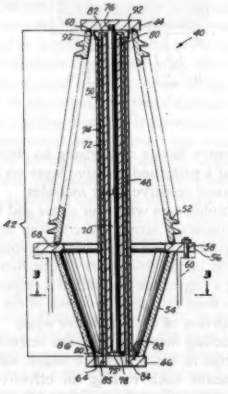
---

4,214,118

## ELECTRICAL BUSHING

Keith I. Gray, LaVerne, Calif., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 8, 1976, Ser. No. 721,379
Int. Cl.² H01B *17/26*
U.S. Cl. 174—15 BH 17 Claims



1. An electrical bushing comprising:
an elongated, hollow insulator column having first and second ends, said insulator column having a first coefficient of thermal expansion;
a first conductive flange adjacent said first end of said insulator column;
a second conductive flange adjacent said second end of said insulator column;
through-rod assembly means for biasing said first conductive flange towards said second conductive flange such that said first and second conductive flanges cooperate with the insulator column to form a substantially enclosed chamber whose axial length is defined by the distance between said conductive flanges; said through-rod assembly means comprising a plurality of elements, at least two of said elements having differing coefficients of thermal expansion, said elements arranged in such a manner that the effective coefficient of thermal expansion of said through-rod assembly means in the direction of said axial length of said chamber is approximately equal to the effective coefficient of thermal expansion of said insulator column in the direction of said axial length of said chamber.

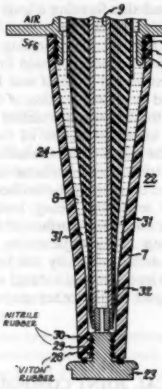
---

4,214,119

## CORROSIVE RESISTANT SEAL FOR EPOXY SHELL BUSHINGS, METHOD OF PROVIDING SAME, AND GASKET THEREFOR

William A. Keen, Jr., Cheshire, Mass., assignor to General Electric Company

Filed May 3, 1978, Ser. No. 902,492
Int. Cl.² H01B *17/30;* F16J *15/10*
U.S. Cl. 174—31 R 3 Claims

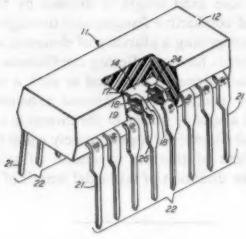



1. A high voltage oil-filled bushing for use with an enclosure containing a fluid comprising:
a top porcelain portion and a bottom epoxy portion;
a connecting flange at one end and a metal lip at an opposite end of the bottom portion;
a paper wound metal conducting tube concentrically located within the top and bottom portions;
at least one acid resistant fluoroelastomer rubber outer gasket and at least one fluid impervious nitrile rubber inner gasket at the flange end of the bottom portion for preventing contact between the oil and the fluid at the flange end of the bottom portion; and
at least one acid resistant fluoroelastomer rubber outer gasket and at least one fluid impervious nitrile rubber inner gasket at the metal lip end of the bottom portion for preventing contact between the oil and the fluid at the metal lip end of the bottom portion.

## 4,214,120
## ELECTRONIC DEVICE PACKAGE HAVING SOLDER LEADS AND METHODS OF ASSEMBLING THE PACKAGE

William T. Jones, Jr., and Edward J. Moulis, both of Raytown, Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,289
Int. Cl.[2] H05K 1/06
U.S. Cl. 174—52 FP 8 Claims



1. An electrical structure comprising:

a metal body having at least one end with first and second lateral edges and a top edge extending between the lateral edges, the end having a first slit extending from the first lateral edge of the body toward the center of the body and a second slit located substantially at a right angle to the first slit, the second slit originating at an intersection with the first slit and extending away from said end of the body, said first and second slits forming a lead stub bounded by said first lateral edge of the body and by said first and second slits, said first slit also forming a flag from the body, said flag being bounded by said first slit, by an end portion of said first lateral edge of said body, by the top edge of the end and by an end portion of the second lateral edge of the body, the flag being attached to the body by a support bounded by an extension of the second lateral edge away from the flag and by the second slit; and

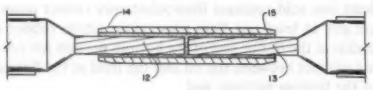
a substrate having two major surfaces and at least one contact pad located on each of the surfaces adjacent to an edge thereof, the lead stub being located against the contact pad on the one major surface of the substrate and the support forming a step adjacent to the edge of the substrate, the flag being offset by the height of the step with respect to the lead stub and located against the corresponding contact pad on the other major surface of the substrate.

---

## 4,214,121
## ELECTRICAL JOINT COMPOUND

Mitchell D. Charneski, 25900 Mulberry Dr., Southfield, Mich. 48034; James K. Kelley, 9188 Grafton Rd., Carleton, Mich. 48117, and Frank J. Gazdecki, 11243 Wynn Dr., Pinckney, Mich. 48169

Continuation-in-part of Ser. No. 648,453, Jan. 12, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 882,994
Int. Cl.[2] H02G 15/00
U.S. Cl. 174—84 C 13 Claims



1. A compression electrical-mechanical joint for electrically and mechanically connecting the bared ends of electrical power cables capable of carrying heavy current in power distribution systems, characterized in that the joint has an electrical conductance at least substantially equal to an equal length of conductor, capable of maintaining high conductance and mechanical strength over a very great number of thermal recyclings which comprises

a connector body having a tubular portion,

the bared end of an electrical conductor in said portion,

a highly thermally conductive compound comprising a thermosetting hardened resin containing a uniformly dispersed mixture of fine and coarse metal particles, said fine particles being 200–500 mesh, said coarse particles being 10–100 mesh, the ratio by weight of coarse particles (C) to fine particles (F) being expressed by:

$$C/F - 1/20 \text{ to } 1/1,$$

the ratio by weight of all metal particles (P) to resin (R) is expressed by:

$$P/R = 3/2 \text{ to } 6/1$$

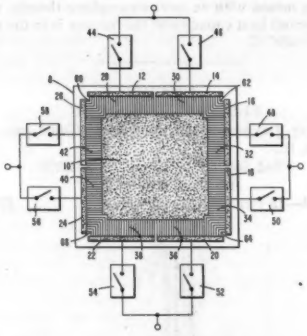
and in which the tubular metal portion has been compressed onto the cable end with a force intensity sufficient to have substantially reduced the diameter of the cable and to produce substantial contact between the inner surface of the connector body and outer surface portions of the conductor.

---

## 4,214,122
## RESISTIVE PLANAR GRAPHICAL ENTRY DEVICE

Victor B. Kley, Berkeley, Calif., assignor to Kley, Fitting, Fitting, Nalley and Smith, Berkeley, Calif.

Continuation-in-part of Ser. No. 867,516, Jan. 6, 1978, which is a continuation-in-part of Ser. No. 712,748, Aug. 9, 1976, Pat. No. 4,079,194. This application Mar. 6, 1979, Ser. No. 18,031
Int. Cl.[2] G08C 21/00
U.S. Cl. 178—18 6 Claims



1. A graphical entry device comprising an electrically insulated substrate; and a patterned resistive layer on the substrate wherein the patterned resistive layer includes

a rectangular graphic area with four edges and four corners,

four pairs of conductor strips spaced from and extending along the respective four edges of the graphic area, each conductor strip of the four pairs of conductor strips extending along a respective one half of a respective edge of the four edges from a respective corner of the four corners to a middle portion of the respective edge,

four edge connecting means joining the respective pairs of conductor strips to the respective edges, said four edge connecting means each having an effective resistance parallel to the respective edges of the rectangular graphic area substantially greater than that of the graphic area and the four pairs of conductor strips, and

four corner connecting means joining outer end portions of

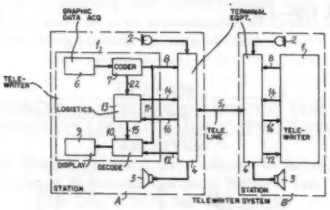
the four pairs of conductor strips adjacent to the respective four corners, each of said four corner connecting means having an effective resistance which is substantially greater than that of the graphic area and the four pairs of conductor strips and which is selected to improve the linearity of a voltage gradient in the rectangular graphic area.

---

## 4,214,123
## BIDIRECTIONAL TELEWRITING SYSTEM OPERATING IN AN ALTERNATING MODE OVER A SINGLE CARRIER

**Jean-Paul G. Dagnelie, Rennes, France, assignor to Etablissement Public de Diffusion dit "Telediffusion de France", Montrouge, France**

**Filed Sep. 5, 1978, Ser. No. 939,188**
**Claims priority, application France, Sep. 26, 1977, 77 29413**
**Int. Cl.[2] H04L *5/16*; G08C *21/00***
**U.S. Cl. 370—31** **7 Claims**

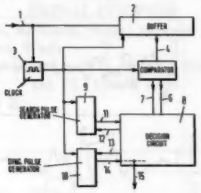



1. A bidirectional telewriting system, which operates in an alternating mode over a single carrier, comprising an information transmission route having opposite ends, two telewriting apparatus respectively connected at said opposite ends of said telewriting information transmission route, the transmission route being connected in each apparatus to a coupler having an input connected by a transmission link to the output of a modulator which modulates the carrier with the local telewriting information, the output of the coupler being connected by a reception link to the input of a demodulator which demodulates the signal coming from the transmission route, the modulator being connected to a telewriting transmitter and the demodulator to an information display apparatus, in which commutators are connected in the transmission and reception links and are adapted to close one link while opening the other link and vice versa, the commutators being controlled by a controlling circuit which causes said commutators to maintain closure of the transmission link when the transmitter from the apparatus in which it is a part is in or is passing to the enabled state and the transmission link is already closed, the control circuit in the other apparatus applying to its associated commutator signals such that the states of the links are the inverse of those in the first apparatus, said system being characterized by the control circuit activating the aforesaid commutators to alternately close the transmission and reception links when said transmitters in the apparatus are at rest and inversely the states of the associated links when the transmitter with its transmission links closed passes to the rest state.

## 4,214,124
## METHOD AND DEVICE FOR EXTRACTING A SYNCHRONIZING SIGNAL FROM AN INCOMING PCM SIGNAL

**Daniel J. Jarus, XA Kouderkerk aan de Rijn, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands**

**Filed Sep. 25, 1978, Ser. No. 945,223**
**Claims priority, application Netherlands, Sep. 29, 1977, 7710670**
**Int. Cl.[2] H04L *7/00***
**U.S. Cl. 375—114** **14 Claims**




1. Method for extracting a synchronizing signal from an incoming PCM signal having a synchronizing signal occurring periodically in the incoming signal being searched and a synchronizing pulse being delivered to a following circuit when said synchronizing signal is found in said incoming signal, said method comprising: searching for and counting the synchronizing signals in one and the same position in the received signal, detecting an incorrect synchronizing signals, and searching for the synchronizing signal simultaneously in another position in the incoming signal immediately after an incorrect synchronizing signal has been detected.

---

## 4,214,125
## METHOD AND APPARATUS FOR SPEECH SYNTHESIZING

**Forrest S. Mozer, 38 Somerset Pl., Berkeley, Calif. 94707, and Richard P. Stauduhar, Berkeley, Calif., assignors to Forrest S. Mozer, Berkeley, Calif.**

**Continuation of Ser. No. 632,140, Nov. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 525,388, Nov. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,859, Jan. 14, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 761,210**
**Int. Cl.[2] G10L *1/00***
**U.S. Cl. 179—1 SM** **100 Claims**

1. A method of analyzing speech information comprising the steps of time quantizing the amplitude of electrical signals representative of selected speech information into digital form, selectively compressing the time quantized signals by discarding selected portions thereof while substantially simultaneously generating instruction signals as to which portions have been discarded, and storing both the compressed signals and instruction signals, wherein said method further includes:

(a) time differentiating the electrical signals prior to the time quantizing step and the signal compressing and storing steps include the steps,

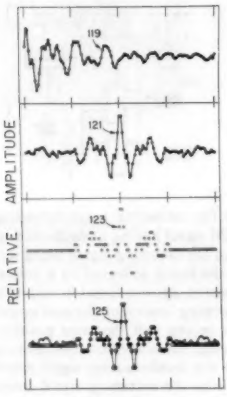
(b) selecting signals representative of certain phoneme and phoneme groups from the time quantized signals and replacing portions of these selected signals corresponding to parts of the pitch periods of the certain phonemes and phoneme groups by a constant amplitude signal while generating instruction signals as to which phonemes and phoneme groups have been so selected,

(c) selecting signals representative of certain phonemes and phoneme groups from the time quantized signals and storing only portions of these selected time quantized signals corresponding to every nth pitch period of the waveform of the original speech information electrical

signal, and storing instruction signals as to which phonemes and phoneme groups have been so selected and storing instruction signals as to the values of n,

(d) separating and storing the time quantized signals representative of spoken words into two or more parts, with such parts of later words that are identical to parts of earlier words being deleted from storage while instructions signals as to which parts are deleted are stored,

(e) storing portions of the time quantized signals corresponding to selected phonemes and phoneme groups according to their ability to blend naturally with any other phoneme, the selected phonemes and phoneme groups including




voiced and unvoiced fricatives, voiced and unvoiced stop consonants, and nasal consonants,

(f) delta-modulating the time quantized signals, and

(g) Mozer phase-adjusting a selected periodic waveform by Fourier transforming the time quantized signals to generate a set of discrete amplitudes and phase angles, adjusting these phase angles so that the inverse Fourier transformation of the amplitudes and new phases is symmetric, inverse Fourier transforming the phase adjusted amplitudes and phases, storing one-half of a selected waveform as representative of each discrete set of phase adjusted amplitudes and phases and discarding the other half of the selected waveform.

---

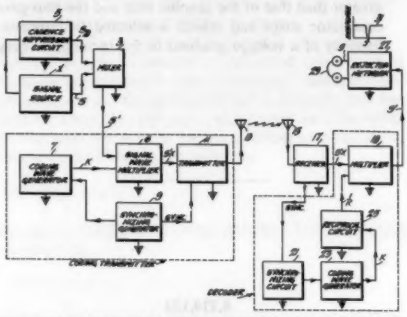
**4,214,126**

## CADENCE SUPPRESSION SYSTEM

**Frank P. Wipff, Garland, Tex., assignor to RCA Corporation, New York, N.Y.**

**Filed Apr. 30, 1945, Ser. No. 591,067**
**Int. Cl.[2] H04K *1/02***
**U.S. Cl. 179—1.5 M** **25 Claims**

23. The method of suppressing cadence in a communication signal comprising the steps of delaying the envelope of said signal, generating a spurious signal having characteristics which are a function of the delayed envelope of said communication signals, and combining said communication signals and said spurious signal to provide a distorted communication



signal in which the original signal cadence is substantially suppressed.

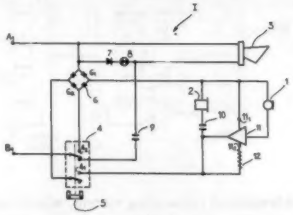
---

**4,214,127**

## INTRINSICALLY SAFE TELEPHONE NETWORK

**Michel L. Oules, Sevres, France, assignor to S.I.L.E.C.-Division Signalisation Industrielle, Paris, France**

**Filed May 17, 1978, Ser. No. 907,051**
**Claims priority, application France, May 18, 1977, 77 15444**
**Int. Cl.[2] H04M *1/18***
**U.S. Cl. 179—2 R** **6 Claims**



1. An intrinsically safe telephone network comprising a manual exchange, various supply sources including a d.c. supply source, all the supply sources being at said exchange, a limiter-repeater circuit coupled to said manual exchange and said d.c. supply source, a remote telephone set and a telephone line, interconnecting said limiter-repeater circuit and said telephone set, wherein the telephone set comprises a solid-state amplifier serially connected with a microphone, said amplifier being supplied with an operating voltage from said d.c. supply source only when the telephone handset is off-hook, and a loud-speaker, said loud-speaker being a.c. connected by a capacitive connection to the telephone line when the telephone handset is on-hook.

---

**4,214,128**

## METHOD AND APPARATUS FOR DEMULTIPLEXING MULTIPLEXED SEISMIC DATA

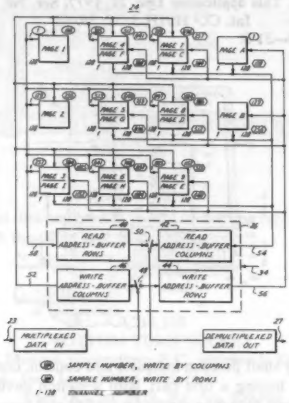
**David B. Bovee, Katy, and Ben B. Thigpen, Houston, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.**

**Filed Sep. 28, 1978, Ser. No. 946,897**
**Int. Cl.[2] H04J *3/02*; G01V *1/24***
**U.S. Cl. 370—112** **12 Claims**

1. An improved method for demultiplexing a plurality of scans of multiplexed digital data samples from a first recording cycle of a multiple input-channel data acquisition system, from

channel-sequential order by sample number to sample-sequential order by channel number, comprising the steps of:

assigning a plurality of memory elements in a digital memory to form a two dimensional rectangular array of rows and columns of elements;




sequentially loading each side scan of multiplexed data samples into said array by columns, a different column being selected for each scan; and

sequentially extracting said column-loaded data samples from said array by rows in demultiplexed format, a different row being selected for each channel.

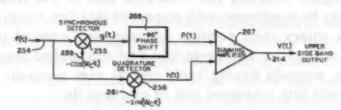
---

**4,214,129**

## SIDEBAND CANCELLATION CIRCUIT FOR A TRANSMISSION LINE COMMUNICATIONS SYSTEM RECEIVER

**Mahlon D. Kimbrough, Hurst, Tex., assignor to Reliance Telecommunication Electronics Company, Bedford, Tex.**

**Filed Dec. 4, 1978, Ser. No. 966,194**
**Int. Cl.² H04J 1/14**
**U.S. Cl. 370—57** **9 Claims**




9. In a plural channel telephone carrier system for transmitting and receiving a plurality of frequency spaced double sideband amplitude modulated carrier signals on a trunk line between two end central offices, each of said carrier signals being associated with one of said channels, one of the sidebands of said channel carrier signal containing signalling information signals for said channel and the other of the sidebands of said channel carrier signal containing signalling information signals for the next adjacent channel, a receiver for recovering the signalling information signals for said channel comprising:

a source of first and second reference signals out of phase with but at the same frequency as said carrier signal;

a first means responsive to said received channel carrier signal and said first reference signal for generating an output signal representing the demodulated signalling information signals contained in said channel carrier signal;

a second means responsive to said received channel carrier signal and said second reference signal for generating an output signal representing the demodulated signalling information signals contained in said channel carrier signal, the demodulated signalling information signals for said channel being in phase and the demodulated signalling information signals for the next adjacent channel being out of phase with the respective parts of said first means output signal; and

means responsive to said first and second output signals for summing the output signals whereby the demodulated signalling information signals which are in phase are added and the demodulated signalling information signals which are out of phase are cancelled.

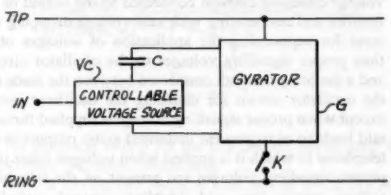
---

**4,214,130**

## SIGNAL COUPLER

**Philip J. Questad, Kirkland, Wash., assignor to Teltone Corporation, Kirkland, Wash.**

**Filed Mar. 10, 1978, Ser. No. 885,375**
**Int. Cl.² H04M 1/00**
**U.S. Cl. 179—81 R** **16 Claims**




1. In a telephone communication system including balanced tip and ring leads and a gyrator and a capacitor circuit, said gyrator and capacitor circuit connected together so as to perform the function of an inductor, said gyrator and capacitor circuit connected to said balanced tip and ring leads for providing a holding current path when a telephone is connected to said tip and ring leads, the improvement comprising modulation means referenced to a predetermined voltage level for modulating the holding current flowing through said gyrator.

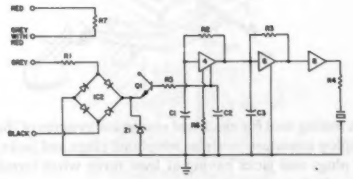
---

**4,214,131**

## ELECTRONIC AUDIO SIGNALLING DEVICE FOR TELEPHONES

**Terry D. Bush, and D. Joseph Denen, both of Columbus, Ohio, assignors to Floyd Bell Associates Inc., Columbus, Ohio**

**Continuation-in-part of Ser. No. 843,456, Oct. 19, 1977, Pat. No. 4,157,459. This application Dec. 18, 1978, Ser. No. 970,633**
**The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.**
**Int. Cl.² H04M 1/00**
**U.S. Cl. 179—84 T** **9 Claims**




1. A signalling device for telephones or the like comprising a housing, a printed circuit board mounted within the housing and carrying solid state circuit components in a circuit, a piezoelectric actuated flexible diaphragm also mounted within the housing in spaced relationship to said circuit board, said flexible diaphragm carrying a piezoelectric element connected in the circuit, said circuit including:

a set of leads adapted to be connected to the telephone voltage supply line for receiving signalling voltage therefrom;

a square wave oscillator audio-signalling circuit connected to said leads and including a square wave driving network with oscillator frequency controlling components connected to a buffer driving network including said piezoelectric element;

a rectifying and voltage-limiting network connected between the leads and the oscillator circuit for receiving, rectifying and limiting the voltage supplied by the telephone voltage supply line to a selected range and applying the resulting output voltage to the oscillator circuit, said rectifying and voltage limiting network including a full wave bridge rectifier which effects full wave rectification of the incoming signal voltage allowing both halves to provide voltage to the oscillator circuit, a voltage dropping element connected with the bridge rectifier to serve as a current limiting element to protect the rectifier, and a voltage clamping element connected to the output of the rectifier and cooperating with said voltage dropping element for suppressing the application of voltages other than proper signalling voltages to the oscillator circuit; and a disabling network connected between the leads and the oscillator circuit for disabling the oscillator circuit except when proper signalling voltage is supplied through said leads so as to prevent undesired audio outputs in the telephone to which it is applied when voltages other than proper signalling voltages are present on the telephone voltage supply line, said disabling network including signal-attenuating components for preventing application of voltages to the oscillator circuit unless they are in the selected range of proper signalling voltages.

---

**4,214,132**

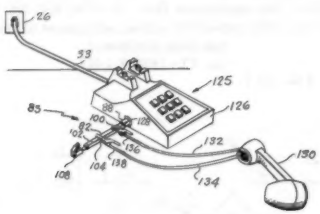
## TESTING TOOLS FOR MODULAR TELEPHONE SYSTEM

**Thomas W. Kelso, P.O. Box 452, Little River, Tex. 76554**

**Filed Jan. 24, 1978, Ser. No. 871,857**

**Int. Cl.[2] H04M *1/24***

**U.S. Cl. 179—175** **12 Claims**




11. A testing tool for electrical connector systems of the type that employ miniature modular telephone plugs and jacks, each of said plugs and jacks having at least three wires terminated therein, which comprises:

connector means adapted to mate with one of said miniature modular plugs or jacks and having at least three test wires terminated;

at least three exposed conductor pads connected respectively in series with said three test wires for permitting attachment of test apparatus thereto; and

a rigid, elongated housing for supporting said pads.

**4,214,133**

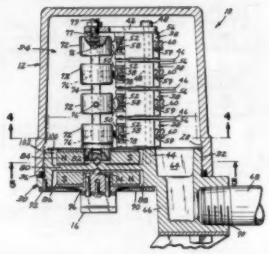
## ROTARY SHAFT POSITION SWITCH

**Byron F. Wolford, Rte. 6, Fergus Falls, Minn. 56537, and John F. Rose, Rte. 1, Underwood, Minn. 56586**

**Continuation-in-part of Ser. No. 758,577, Jan. 12, 1977, abandoned. This application Dec. 22, 1977, Ser. No. 863,219**

**Int. Cl.[2] H01H *3/32, 19/60***

**U.S. Cl. 200—31 R** **12 Claims**



1. A rotary shaft position indicator and control, comprising:

a housing having a first part with a switch cavity and a second part including means for sealing said housing from the exterior surroundings of said housing whereby said switch cavity is protected from dust, moisture, corrosive or explosive foreign materials;

switch means disposed within said switch cavity for providing indication or control signals when actuated;

a rotatable spindle mounted within said cavity and having a first axis of rotation, said spindle further having means for selectively actuating said switch means upon rotation of said spindle;

a first magnet secured to said rotatable spindle adjacent said switch cavity;

a second magnet having a second axis of rotation and being magnetically coupled through a wall of said housing second part to said first magnet whereby upon rotation of said second magnet said spindle is thereby rotated; and

means for flexibly coupling the rotary shaft to said second magnet whereby the rotational axis of the rotary shaft may be misaligned with respect to said first rotational axis.

2. A rotary shaft position indicator and control in accordance with claim 1 wherein said first and second magnets are annular magnets having their central axes normally aligned along said first rotational axis of said spindle.

---

**4,214,134**

## TIME DETECTING SWITCH FOR ALARM CLOCK

**Masuo Ogihara; Kozo Chimura, and Nobuo Shinozaki, all of Yotsukaido, Japan, assignors to Seiko Koko Kabushiki Kaisha, Japan**

**Filed May 22, 1978, Ser. No. 908,559**

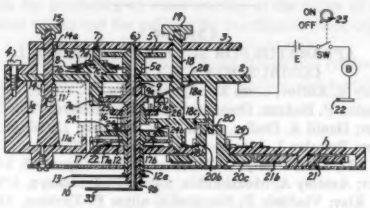
**Claims priority, application Japan, May 26, 1977, 52-67947[U]**

**Int. Cl.[2] G04C *21/16;* H01H *43/10***

**U.S. Cl. 200—37 R** **2 Claims**

1. A time detecting switch for an alarm clock having phase detecting type slide switches disposed between rotatable coaxially mounted pairs of time wheels and detecting wheels which are rotated to phases corresponding to an alarm signalling time according to an alarm signalling time setting comprising: one of the pair of two kinds of wheels, the time wheels and the detecting wheels, comprising a disk of electrically insulating material having a hole therethrough and an electrically con-

ductive switch plate mounted on one face of said disk and having an electric contacting portion extending through said



hole in said disk and bent to form a contacting face in the same plane with the other face of said disk.

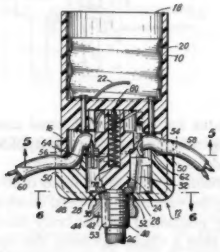
---

**4,214,135**

## BOTTOM TURN SOCKET

**Ronald G. Munroe, Georgetown, S.C., assignor to Eagle Electric Mfg. Co., Inc., Long Island City, N.Y.**

**Filed Oct. 30, 1978, Ser. No. 955,986**
**Int. Cl.² H01R** *33/28, 13/58*
**U.S. Cl. 200—51.17** **6 Claims**



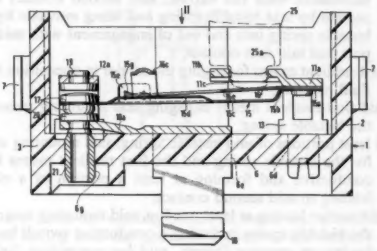
1. A bottom turn socket comprising a husk, means at one end of said husk for receiving the threaded base of a light bulb, means within said husk for supplying electric power to said light bulb via said threaded base, means within said husk for selectively interrupting the flow of electric power flow to said light bulb, said means for interrupting electric power flow including a switch, said switch including a central axial stem, means mounting said stem to the other end of said husk, said other end of the husk having a centrally disposed bottom opening recess, said stem being located centrally of said recess, said stem terminating with a manually operable turn knob, said switch being manipulated by partial rotation of said turn knob, terminal means at the other end of said husk within said recess for connection to the ends of a line cord so as to furnish electric power to said light bulb, a generally cup-shaped cover housing including a crown and a skirt, said crown having an opening through which the stem extends, and means detachably mounting said cover housing to said other end of said husk, said cover housing covering the other end of said husk and said skirt being telescoped over said other end, said cover housing having at least one peripheral slot in its skirt in which said line cord is located, said cover housing including at least one interior boss adjacent said slot, said boss having a chisel-shaped tip extending into said recess and radially aligned with said slot, the tip of said boss pinching said line cord against the other end of said husk when the cover housing is emplaced, to provide strain relief.

**4,214,136**

## ELECTRICAL SWITCHES FOR CONTROL DEVICES SUCH AS TEMPERATURE REGULATORS

**Guglielmo Rossi, Linkenheim, and Hans Bösing, Oftersheim, both of Fed. Rep. of Germany, assignors to Ranco Incorporated, Columbus, Ohio**

**Filed Feb. 16, 1979, Ser. No. 13,194**
**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807943**
**Int. Cl.² H01H** *5/26*
**U.S. Cl. 200—67 DA** **15 Claims**



1. An electrical switch for use in a control device such as a temperature regulator, comprising:

a housing having two stops, at least one of which is a fixed switch contact; and,

a movable switch contact assembly which is movable between the two stops and is normally in abutment with one of said stops;

the improvement comprising;

the movable switch contact assembly comprising a contact and contact carrying arm of electrically conductive material, and a Q-shaped snap action spring cooperating with said arm to snap move the arm for opening and closing the contacts said spring having two legs which are drawn toward each other to stress the spring and a trip tongue projecting from a portion of the spring interconnecting said legs, and

said arm and said snap action spring being cantilevered within the housing and disposed substantially parallel to one another.

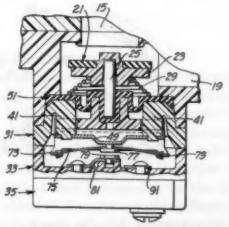
---

**4,214,137**

## PRESSURE SWITCH WITH SNAP ELEMENT

**E. Dale Hartley, Los Angeles, Calif., assignor to Product Research and Development, Anaheim, Calif.**

**Filed Oct. 13, 1978, Ser. No. 951,110**
**Int. Cl.² H01H** *35/34*
**U.S. Cl. 200—83 P** **7 Claims**



1. A pressure switch comprising:

a housing;

a first contact;

means for mounting said first contact in said housing;
a second contact;
a support;
means for mounting said support in said housing with said second contact being intermediate said support and said first contact;
first means in said housing exposable to fluid under pressure and movable in a first direction in response thereto;
a carrier mounted for movement in said housing with said first means;
a bistable spring;
means for mounting the bistable spring on the carrier for movement with the carrier, said second contact being carried by said bistable spring and being movable by said bistable spring into and out of engagement with said support and said first contact;
first resilient means for urging the carrier in opposition to the fluid pressure;
said first resilient means engaging said mounting means for the bistable spring;
at least portions of said bistable spring, said mounting means for the bistable spring and the first resilient means being conductive and forming at least a portion of a circuit leading to said second contact;
said carrier having at least one lug, said mounting means for the bistable spring including a conductive switch bracket having an opening therein, said lug projecting through said opening; and
said first resilient means including a conductive coil spring engaging said switch bracket around said opening and surrounding said lug, said coil spring and said switch bracket forming portions of said circuit.

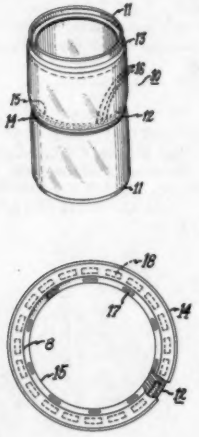
---

**4,214,138**

## VAPOR SHIELD SUPPORT RING FOR A VACUUM INTERRUPTER

**John R. Lucek, Cheshire, and David L. McCall, Dalton, both of Mass., assignors to General Electric Company, New York, N.Y.**

**Filed Mar. 8, 1978, Ser. No. 884,617**
**Int. Cl.[2] H01H *9/02*; C03B *19/04*; C03C *27/00*; H01H *33/00***
**U.S. Cl. 200—144 B** **13 Claims**




1. An improved shield support ring for vacuum switch enclosures of the type consisting of a glass envelope containing a shield support ring having a plurality of passages through the ring for the transport of molten glass during the glass forming process, the improvement which comprises:
the passages of said shield support ring having a minor and major dimension wherein the minor dimension is less than the major dimension for providing encapsulation of the passages within the glass envelope.

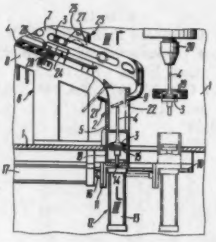
---

**4,214,139**

## APPARATUS FOR SURFACING INTERNAL COMBUSTION ENGINES VALVES

**Anatoly E. Kozlov, ulitsa Revoljutsionnaya, 73, kv. 85, Tolyatti; Bogdan P. Budzan, Dneprovskaya naberezhnaya, 11, kv. 122, Kiev; Danil A. Dudko, ulitsa Anri Barbjusa, 22/26, kv. 113, Kiev; Boleslav I. Maximovich, ulitsa Anri Barbjusa, 22/26, kv. 107, Kiev; Vitaly V. Zavodian, bulvar Lepse, 55, kv. 20, Kiev; Anatoly A. Mozzhukhin, ulitsa Grodnenskaya, 3/5, kv. 37, Kiev; Vladimir P. Sotchenko, ulitsa P. Tychiny, 13, kv. 210, Kiev; Vladimir M. Golovnin, Moskovsky prospekt, 78/178, kv. 338, and Nail S. Farrakhov, ulitsa Jubileinaya, 1114, kv. 142, both of Tolyatti, all of U.S.S.R.**

**Filed Mar. 10, 1978, Ser. No. 885,201**
**Int. Cl.[2] B05C *13/02*; H05B *5/00***
**U.S. Cl. 219—9.5** **6 Claims**



1. An apparatus for surfacing internal combustion engine valves by fusing refractory alloy rings applied to the seating surfaces of heads of the valves comprising:
a means for fitting a ring to be fused onto a valve and for positioning the valve with its head downwards including: a vertically positioned tubular body having in its wall a transverse slot; a chute adjoining the upper end of said body and adapted for feeding thereto the valve with its head upwards; a chute ajoining the wall of said body and adapted for delivering the ring through said slot to the interior of said body; a thrust member arranged on an upper portion of said body and interacting with the valve stem so that the valve is positioned with its head downwards when said valve enters said body;
a heating means for fusing the rings to the heads;
a pushing means adapted for delivering the valve to said heating means and mounted underneath said body for reversible movement so that said pushing means is alternatively placed under said heating means and under said tubular body, said pushing means including:
a platform adapted for receiving the valve head downwards; and
a means for fixing the valve within said heating means.

---

**4,214,140**

## RESISTANCE WELDING MACHINE FOR SEAM WELDING OF BLANKS OR THE LIKE

**Paul Opprecht, Im hintern Bernold, 8962 Bergdietikon, Switzerland**

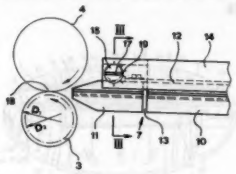
**Filed Sep. 18, 1978, Ser. No. 943,296**
**Claims priority, application Switzerland, Oct. 27, 1977, 13069/77**
**Int. Cl.[2] B23K *31/06, 11/06***
**U.S. Cl. 219—61.3** **10 Claims**

1. A resistance welding machine for seam welding of blanks, comprising:

a pair of cooperating electrode rolls for welding rolled blanks at a welding seam;

a movable guide device arranged forwardly of said electrode rolls for producing an exact overlap at the edges of the rolled blanks and for guiding the overlapped blank edges to a welding point between the electrode rolls;

said movable guide device comprising at least two relatively movable sections including a first section and a second movable section;



said second movable section being located forwardly and in the vicinity of the welding point between the pair of cooperating electrode rolls;

said first section being operatively associated with one of the electrode rolls; and

adjusting means for aligning the movable second section of the guide device essentially at the welding point and independently of the first section.

---

**4,214,141**

## MULTIPLE ELECTRODE SUBMERGED ARC WELDING METHOD

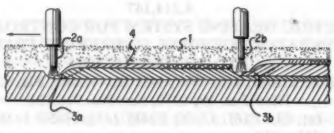
**Naoki Okuda, Kamakura, and Akira Nakano, Hiratsuka, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan**

**Filed Dec. 29, 1978, Ser. No. 974,546**

**Claims priority, application Japan, Dec. 29, 1977, 52/160428; Dec. 29, 1977, 52/160429; Aug. 21, 1978, 53/102156**

**Int. Cl.² B23K *9/18***

**U.S. Cl. 219—73** **11 Claims**



1. A multiple electrode welding method which comprises:

arranging a plurality of electrodes in such a manner that the distance is at least 300 mm between a first molten pool formed by multilayer welding by a single or a plurality of electrodes preceding along a weld line and a subsequent molten pool formed by a single subsequent electrode or plurality of subsequent electrodes;

forming slag having a composition which comprises:

$TiO_2$:20–65% by weight

$CaF_2$:9.6–40% by weight, and

$Al_2O_3$: 10–56% by weight

on weld metal formed by an electrode or a preceding electrode forming a preceding layer, and

welding along said weld line, without removing said slag, using said single subsequent electrode or said subsequent plurality of electrodes for forming said subsequent molten pool layer.

**4,214,142**

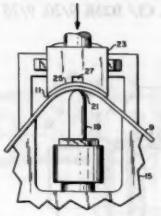
## APPARATUS AND PROCESS FOR WELDING PLATED PARTS

**Alton L. Crosby, Seneca Falls, and Harry R. Swank, Waterloo, both of N.Y., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Aug. 21, 1978, Ser. No. 935,232**

**Int. Cl.² B23K *11/30***

**U.S. Cl. 219—86.25** **12 Claims**



1. In a process for welding plated rimbands and plated ear members having base and upstanding portions and suitable to an implosion-resistant cathode ray tube wherein the plated rimbands and ear members base portion are placed in contacting relationship between first and second electrodes which are energized in an amount and for a time sufficient to effect welding thereof, the improvement comprising the step of forming said second electrode to have a surface contour substantially similar to the surface contour of said base portion of the ear member and a slot therein positionally located substantially opposite to said first electrode.

---

**4,214,143**

## CONDUCTOR CONNECTOR IN FLASH WELDING APPARATUS

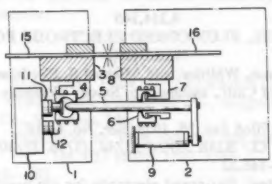
**Takao Kawanami, Tohkai; Hiromi Tajiri, and Akiyoshi Uomori, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan**

**Filed Jul. 14, 1978, Ser. No. 924,571**

**Claims priority, application Japan, Jul. 15, 1977, 52/84769**

**Int. Cl.² B23K *11/04*; H01R *41/00***

**U.S. Cl. 219—97** **2 Claims**



1. A flash welding apparatus comprising:

a pair of electrode tables which face each other and can be relatively shifted, one of the tables having disposed therein a first electrode, a first sliding conductor, and a transformer for welding, the transformer having a secondary winding, one end of the secondary winding being connected to the first electrode and the other end of the secondary winding being connected to the first sliding conductor, the other of the tables having disposed therein a second electrode, a second sliding conductor connected to the second electrode, and a connecting conductor disposable in the second sliding conductor during a non-welding time to avoid obstructing a space between the pair of electrode tables and capable of being extended and inserted in the first sliding conductor during a welding

time to electrically connect both sliding conductors and thereby connect the other end of the secondary winding to the second electrode.

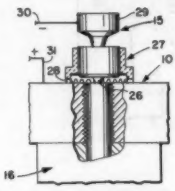
---

**4,214,144**

## STUD WELDING APPARATUS AND PROCESS

Gary R. Spiegelberg, Lagrange, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Mar. 16, 1978, Ser. No. 887,051
Int. Cl.[2] B23K *9/20, 9/28*
U.S. Cl. 219—99 17 Claims




1. Apparatus for facilitating the drawn arc stud welding closure of hole ends in metal objects, comprising a stud larger than and for stud welding over a hole end in a metal object, an electrically conductive refractory insert for drawing a welding arc removably secured within said hole with an end of the insert approximately flush with said hole end, a flux projection secured to the end of a stud to be stud welded against the metal object, and connecting means for electrically connecting the insert to the metal object, whereby stud welding equipment may be electrically connected to the insert and stud for drawing a welding arc between them and effecting the stud welding closure.

13. A method of closing hole ends in metal objects comprising the steps of:

removably securing within a hole in a metal object a refractory electrode means for drawing a welding arc with an end of the electrode means approximately flush with said hole end, connecting stud welding apparatus to the electrode means and a stud, and stud welding the stud to the metal object during which a welding arc is struck between the stud and electrode means.

---

**4,214,145**

## MILD STEEL, FLUX-CORED ELECTRODE FOR ARC WELDING

Albert J. Zvanut, Whittier, and Michael S. Sierdzinski, Montclair, both of Calif., assignors to Stoody Company, Industry, Calif.

Filed Jan. 25, 1979, Ser. No. 6,316
Int. Cl.[2] B23K *35/24, 35/34, 35/36, 35/40*
U.S. Cl. 219—145.22 4 Claims

1. A mild steel, flux-cored electrode for arc welding, comprising:

a sheath of mild steel formed from a strip having an initial thickness of approximately 0.012 inch and a width of approximately 0.505 inch, said sheath being closed to an external diameter of approximately three thirty-seconds of one inch and defining a space for containing a core; and

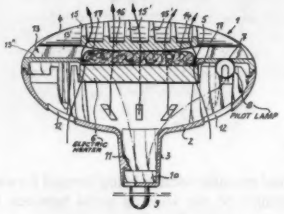
a core in said sheath comprising approximately forty-five percent of the weight of said electrode for any given length, and including a major component of iron powder having an apparent density of approximately three grams per cubic centimeter, said core also including manganese and silicon in an approximate ratio of three to one respectively, whereby upon welding, said electrode will provide a deposit of mild steel consisting of iron and other components in amounts not greater than 1.7 percent manganese and 0.6 percent silicon, by weight of the deposit metal.

**4,214,146**

## ELECTRICALLY HEATED VAPORIZER DEVICE FOR DISPENSING A THERMALLY VOLATILIZABLE SUBSTANCE

Georg Schimanski, Breckerfeld, Fed. Rep. of Germany, assignor to Globol-Werk GmbH, Neuburg, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,608
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730855
Int. Cl.[2] A01M *1/20;* A61L *9/02;* F22B *1/28*
U.S. Cl. 219—274 10 Claims




1. A device for dispensing a thermally volatilizable substance, comprising:

a hollow housing;

an open-ended, open top linear guide channel having a planar floor extending from end to end formed across the upper portion of said housing;

a window formed in the floor of said channel;

a heater disposed beneath said window in alignment therewith and forming a support for a member introduced into said channel through an open end thereof and containing a volatilizable substance;

a protective grid secured to said housing and spanning the open top of said channel above said window and juxtaposed therewith so that said member can be inserted into said channel in a feed direction without removing said grid,; and

at least one elongated runner on said grid extending linearly in said feed direction and engageable with said member introduced into said channel, for pressing said member against said heater.

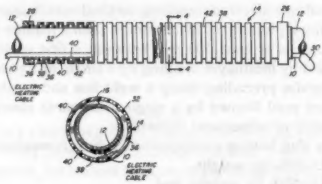
---

**4,214,147**

## ELECTRIC HEATING SYSTEM FOR CONTROLLING TEMPERATURE OF PIPES TO PREVENT FREEZING AND CONDENSATION

Richard A. Kraver, 8111 NW. 54th St., Miami, Fla. 33166

Filed Jun. 19, 1978, Ser. No. 916,734
Int. Cl.[2] F16L *53/00;* F24H *1/12;* H05B *3/58*
U.S. Cl. 219—301 5 Claims




1. A condensation and temperature control system for a pipe carrying a liquid, comprising in combination when installed on the pipe a tubular enclosure for the pipe and an elongated electrical heater in the enclosure adjacent the pipe, the enclosure having walls of substantially uniform thickness and that are substantially non-pervious to moisture said walls being corrugated in the direction of the tubular longitudinal axis so as

to provide a series of axially-displaced air-cell spaces extending circumferentially around the pipe, the innermost diameter of said walls being larger than the outer diameter of the pipe to provide space between said tubular enclosure and said pipe for said heater, the heater being located to heat air in the air cells and by movement of such heated air in said air cells to warm the pipe for preventing freezing of liquid in the pipe, the corrugations rendering the tubular enclosure freely flexible transversely to its longitudinal axis for following a pipe around curves.

---

**4,214,148**

## INDICATOR FOR THE EXTENT OF CLARIFICATION OF WATERHEATERS IN ELECTRIC HOUSEHOLD APPLIANCES

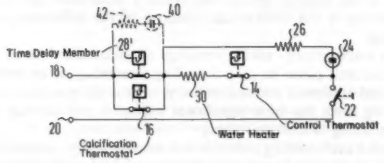
**Werner Fleischhauer, Stein, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 27, 1977, Ser. No. 864,476**

**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659079**

**Int. Cl.[2] H05B** *1/02;* **A47J** *31/56, 31/58;* **F24H** *1/10*

**U.S. Cl. 219—308** **10 Claims**




1. In a water heater associated with an electric household appliance, said water heater being subject to calcification caused reduction in heat transfer through the wall of the water container of the water heater, said water heater having a heater resistor adjacent the water container, a first temperature-dependent switch thermally coupled to the water container being in circuit with said heater resistor to act as the final control for the water heater; the improvement comprising the combination therewith of means for indicating calcification of the water heater, said calcification indicating means comprising a second temperature-dependent switch thermally coupled to the water container, the switching temperature of the second temperature-dependent switch being below the switching temperature of the first temperature-dependent switch and in the range of temperatures which occur with calcification in the water-heating operation, a calcification indicating signal and a time delay member operative after a predetermined time delay to actuate said indicating signal, said time delay member being so arranged in circuit with said first and second temperature-dependent switches that said time delay member is operative to actuate said indicating signal when only a second temperature dependent switch is in responded condition, and which time delay member ceases operation and returns to its original state when the first temperature-dependent switch is in its responded state.



**4,214,149**

## HAND-HELD BLOW DRYER WITH THUMB-OPERABLE CONTROLS

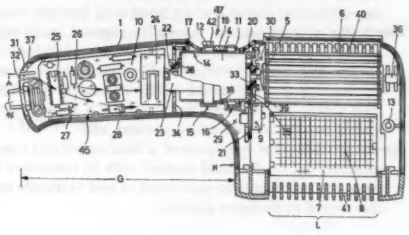
**Karl-Heinz Hoffmann, Wehrheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 14, 1978, Ser. No. 960,715**

**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750954**

**Int. Cl.[2] H05B** *1/00*

**U.S. Cl. 219—370** **10 Claims**



1. A blow dryer comprising:

a housing having a slim handle shaped to be held in the hand and formed with a window, and a large head formed with an outlet;

blower means including an electric motor in said handle having an output shaft extending into said head and a motor casing formed generally as a body of revolution, and a fan mounted in said head on said shaft and rotatable by said motor to blow air from said outlet;

heater means in said housing electrically energizable to heat the air blown by said fan;

a variable circuit element connected to one of said means;

circuit means connectable to a source of electricity and to said circuit element and connected to said one means for varying the energization thereof;

an annular adjustment member carried on and coaxially surrounding said motor casing and rotatable about the axis thereof, said member being exposed at and operable through said window; and

a formation on said member linking same to said circuit element for operation of said one means by said adjustment member.

---

**4,214,150**

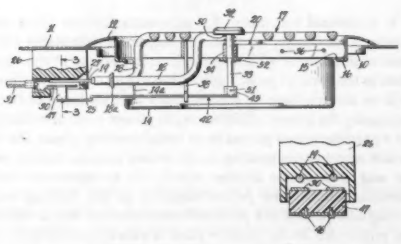
## ELECTRIC HEATING ELEMENTS

**Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed May 10, 1978, Ser. No. 904,556**

**Int. Cl.[2] H05B** *1/02, 3/68*

**U.S. Cl. 219—452** **6 Claims**



1. An electric heating element of the type comprising a

sheathed unit having a flat, spiralled active heating portion with a pair of terminal portions extending downwardly from and laterally of said heating portion, each terminal portion having a rigid terminal pin extending outwardly of the sheated end, said flat heating portion being adapted to directly support a cooking vessel to heat the latter and its contents, the improvement comprising support means, said sheathed with being removable mounted on said support means:

a pair of contact members carried by said support means and, each adapted for connection to an electric power conductor, said contact members being adapted for electric contact with respective terminal pins to provide electrical current to said active heating portion to heat the same,

vertically movable means normally disposed in an upper position above the plane of said flat heating portion when no cooking vessel is supported on said active heating portion, but movable downwardly to a lower position at least within said plane by the weight of a cooking vessel placed on said active heating portion, and

means providing for movement of at least one of said contact members out of electrical contact with its respective terminal pin in response to movement of said vertically movable means to its upper position.

---

**4,214,151**

## CONTROL INSTRUMENT FOR ELECTRIC COOKER PLATES

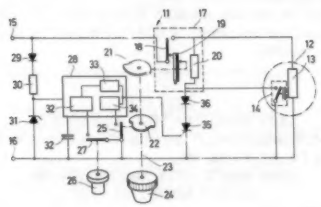
**Robert Kicherer, Knittlingen, and Wilfried Schilling, Kraichtal, both of Fed. Rep. of Germany, assignors to E.G.O. Regeltechnik GmbH, Fed. Rep. of Germany**

**Filed Jul. 5, 1978, Ser. No. 922,027**

**Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731782**

**Int. Cl.² H05B *1/02***

**U.S. Cl. 219—492** **9 Claims**



1. A control instrument for an electric cooker plate, comprising a manually, substantially steplessly adjustable power control instrument which feeds electrical power to the cooker plate in the form of power pulses, having an expansion element with an electric heating means, and a time switch member for increasing the power adjusted on the power control instrument for a predetermined period in an initial cooking phase, the time switch member comprising an electronic counter timing member and at least one divider which, via an electronic switch element, reduces the power supplied to the heating means during said period in a predetermined division ratio, whereby the power fed to the cooker plate is raised according to said predetermined division ratio and in dependence upon the manual adjustment of the control instrument.

**4,214,152**

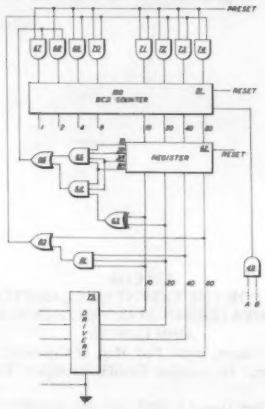
## ERROR CORRECTION IN A REMOTE METER READING DEVICE

**Donald T. Hess, Garden City, N.Y., assignor to Cain Encoder Company, Greenville, N.C.**

**Filed May 12, 1978, Ser. No. 905,538**

**Int. Cl.² G06M *3/12***

**U.S. Cl. 235—92 EC** **27 Claims**




1. In a device for remotely reading the positions of at least two continuously positionable indicators representing a less significant and a more significant digit in any number system, movement of the more significant of the two indicators being in a ratio of 1/N to the less significant indicator where N is the base of the number system employed, a method of correction for errors in the mechanical positions of the indicators comprising:

(a) automatically taking readings of said indicators to one decimal place to give a reading consisting of an integer and a decimal and sequentially, with sensing means, starting with the least significant indicator and storing said reading in storage means;

(b) for each reading after the first automatically, with adding means, adding a correction to the more significant indicator being read, to obtain a corrected reading, based on the last previous reading which will at least approximately tend to make the reading one which falls half way between two adjacent integers on said more significant indicator, assuming the more significant indicator being read is in the correct mechanical position; and

(c) automatically supplying as the reading, from said adding means, the integer which forms part of the corrected reading.

---

**4,214,153**

## TAPE AND TAPE READER ARRANGEMENT FOR PROGRAMMABLE CONTROLLERS

**Ralph Ogden, 1304 Fisher St., Munster, Ind.**

**Continuation-in-part of Ser. No. 779,579, Mar. 21, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,475**

**Int. Cl.² G06K *7/06*; G06F *15/46*; G09C *1/00*; G09B *23/00***

**U.S. Cl. 235—376** **21 Claims**

1. In a programmable controller system for controlling an industrial process, with the system including a central processing unit including an access type memory including a binary notation system responsive instruction register, a programming tape, a tape reader for sensing computer data bits on the programming tape when passed therethrough and connected to said unit for storing the data bits in said memory register, means for connecting I/O devices to said unit, and a work

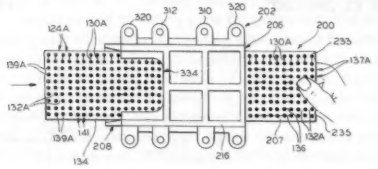
sheet having its face delineated to define the steps of the process in consecutive sequence down the sheet and in manually marked data bit binary notation system fashion horizontal computer word form for each such process step listing in data bit areas of the individual computer words the I/O device functions of the respective process steps and delineating the computer words in equal lengths by means of vertically aligned computer word end indicia at either end of the computer words,

the improvement wherein said tape comprises:

a ribbon formed from light pervious material and including means for delineating same to define a group of channels extending longitudinally thereof for the tape length and shaped and spaced transversely thereof to be aligned congruently with a group of said work sheet words consisting of a predetermined consecutive number of said work sheet words, when said ribbon is disposed with one side of same in juxtaposition with said work sheet face and said words are viewed through the tape,

said ribbon being further delineated by said delineating means along its respective channels to define in said channels I/O device data bit spaces consecutively corresponding to and formed to be congruent with said work sheet data bit areas when said ribbon channels are disposed in congruency with said work sheet words,

means for manually marking said tape spaces, when said tape is sequentially placed in juxtaposed congruency with consecutive of said work sheet word groups in overlying relation to the word spaces thereof, corresponding to the location of the I/O device function marks and the word end indicia of the respective words of the individual




words of the respective work sheet word groups, for transferring onto said tape from said work sheet the process step data word and said word end indicia thereof for each word of consecutive of said work sheet word groups, to form on said tape consecutive sets of said word data, in each set of which the word data of said process steps are consecutively and sequentially disposed transversely of said tape,

said delineating means comprising uniformly spaced apart dots imprinted on the other side of said ribbon by electrically conductive ink,

with said dots of each tape channel being aligned longitudinally of said tape to form the respective channels and said dots of the respective channels and said dots of the respective channels being aligned transversely of the tape to form spaced columns of said dots,

and with the spacing of said columns of dots in the respective channels forming the data bit spaces of the respective channels,

said means for marking said tape channel data bit spaces comprising means for making the tape markings electrically conductive and electrically connect the channel dots defining a tape data bit space to be marked in accordance with the manual markings of the respective work sheet word data bit areas,

said reader including means for serially sensing said tape word sets in consecutive sequence with continuous movement of said tape through said reader for the length of said tape,

said register including means for storing in same, in said consecutive sequence, said word sets for controlling said process through said central processing unit,

said sensing means of said reader comprising a pair of electrical contact rows over which said tape passes with such contacts engaging said other side of said tape,

with the contacts of said contact rows being spaced for congruency with said spacing of said tape dots of said tape channels and columns, and with said marked tape data bit spaces electrically connecting adjacent pairs of said contacts aligned with the respective tape columns as said tape moves thereover to comprise said reader sensing means.

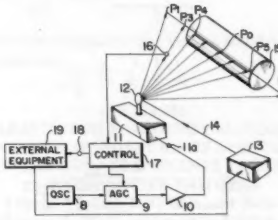
---

**4,214,154**

## LIGHT BEAM SCANNING APPARATUS

**Hideaki Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 17, 1978, Ser. No. 952,053**
**Claims priority, application Japan, Oct. 24, 1977, 52-127797**
**Int. Cl.[2] G01J 1/20**
**U.S. Cl. 250—201** **12 Claims**




1. Light beam scanning apparatus comprising:

a light beam generating means for generating a light beam;

a scanning means for deflecting the direction of said light beam emitted from said light beam generating means;

at least one light beam detect means provided on a scanning line formed by the deflected light beam; and

a first control means for controlling the length of the scanning line according to an output of said light beam detect means.

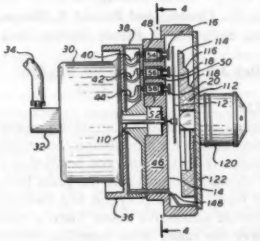
---

**4,214,155**

## SYSTEM FOR DETECTING POSITION OF GAUGE POINTER

**George D. Jones, Deerfield, Wis., assignor to Airco, Inc., Montvale, N.J.**

**Filed Apr. 26, 1978, Ser. No. 899,929**
**Int. Cl.[2] G01D 5/34**
**U.S. Cl. 250—231 R** **8 Claims**




1. A meter having a faceplate, said meter further having a pointer movable in a plane generally parallel to the plane of said faceplate, said pointer adapted to move in response to changes in a detected parameter, light means to direct an elongated beam of light generally along the path of movement of said pointer, said elongated beam of light being directed

toward one side of said pointer opposite said faceplate, detector means located in said faceplate on the other side of said pointer, said detector means being adjustably positionable along said elongated beam of light, said detector means adapted to sense a diminishment of the intensity of said elongated beam of light when said pointer is positioned substantially directly between said light source means and said detector means.

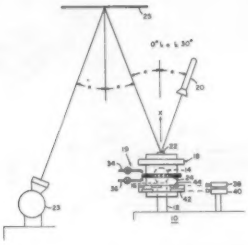
---

**4,214,156**

## GYRODYNAMIC FIXTURE FOR MEASURING THRUST FORCE COMPONENTS

**John W. Farrell, Dallas, Tex., and Jere L. Andrews, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 22, 1978, Ser. No. 972,303**
**Int. Cl.² G01D 5/34**
**U.S. Cl. 250—231 SE** **4 Claims**



1. A gyrodynamic fixture for measuring thrust force components of a rocket motor comprising:
(a) an air bearing assembly for support of said motor;
(b) spin-up means for providing initial spin-up of said rocket motor;
(c) a mirror mounted orthogonal to the spin axis of said motor and on the surface of said motor;
(d) a screen disposed in spaced relation with said mirror, the centerline of said screen being spaced from the centerline of said mirror;
(e) a highly collimated light source spaced from said mirror for reflecting light therefrom to said screen; and
(f) an electo optical tracker means for receiving the reflected light from said screen.

---

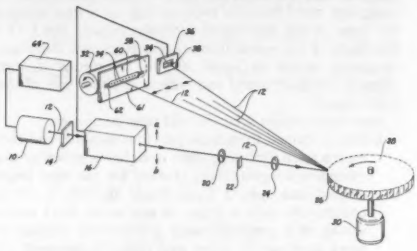
**4,214,157**

## APPARATUS AND METHOD FOR CORRECTING IMPERFECTION IN A POLYGON USED FOR LASER SCANNING

**Frank T. Check, Jr., Orange, and Ronald P. Sansone, Weston, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.**

**Filed Jul. 7, 1978, Ser. No. 922,596**
**Int. Cl.² H01J 3/14**
**U.S. Cl. 250—236** **11 Claims**

1. In a light scanning apparatus comprising means for generating a laser beam, means for modulating the amplitude of the beam, a multifaceted reflective polygon positioned in the beam path, means for rotating the polygon, the beam being reflected from successive facets of the polygon and sweeping along a scan path to provide successive raster lines, a photoreceptor positioned to have the raster lines extending thereacross, the improvement comprising a beam deflection system, the deflection system including electro-optical sensing means, the sensing means being a pair of juxtaposed photodetectors being juxtaposed along an axis in registry with the scan path ahead of the photoreceptor, the electro-optical sensing means detecting the presence of the beam and in response thereto providing at least one signal indicative of the presence of the beam with respect to the longitudinal scan path axis, the signal indicative of the beam comprising a signal generated from at least one of the photodetectors, means receiving the signal indicative of the



presence of the beam and in response thereto deflecting the beam toward the scan path axis.

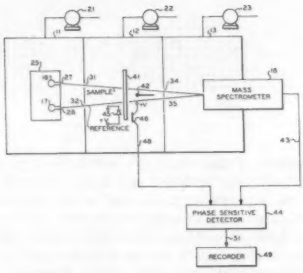
---

**4,214,158**

## DETERMINATION OF INFINITE DILUTION ACTIVITY COEFFICIENTS ($\gamma_\infty$) USING MOLECULAR BEAMS

**Thomas W. Schmidt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jan. 30, 1979, Ser. No. 7,737**
**Int. Cl.² B31D 59/44**
**U.S. Cl. 250—281** **4 Claims**




1. A method for determining infinite dilution activity coefficients comprising the steps of:
forming a first molecular beam from the vapor associated with a solution containing a solvent and a solute infinitely dilute in said solvent;
forming a second molecular beam from the vapor associated with said solvent;
passing said first molecular beam and said second molecular beam alternately to the inlet of a mass spectrometer means, said mass spectrometer means providing a first output signal which is representative of the difference in the pressure of said solute in said first molecular beam and the pressure of said solute in said second molecular beam ($\Delta P_1$) when said mass spectrometer means is set to the mass of said solute, said mass spectrometer means providing a second output signal which is representative of the difference in the pressure of said solvent in said first molecular beam and the pressure of said solvent in said second molecular beam ($\Delta P_2$) when said mass spectrometer means is set to the mass of said solvent; and
establishing the infinite dilution activity coefficient for said solute in response to said first output signal and said second output signal.

## 4,214,159
## APPARATUS FOR ANALYZING SAMPLES BY ELECTROMAGNETIC IRRADIATION

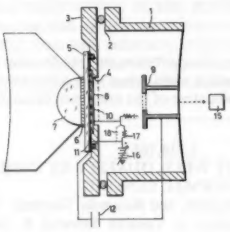
**Franz Hillenkamp, Frankfurt; Raimund Kaufmann, Düsseldorf-Meerbush; Rainer Nitsche, Frankfurt; Eberhard Unsöld, Munich, and Reiner Wechsung, Cologne, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Köln-Bayental, Fed. Rep. of Germany**

**Filed Aug. 31, 1978, Ser. No. 938,491**

**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739829**

**Int. Cl.[2] B01D *59/44*; H01J *39/34***

**U.S. Cl. 250—288** **20 Claims**



**1**. In an apparatus for analyzing a sample by electromagnetic irradiation, including a vacuum chamber having an opening; a covering glass closing off said opening; support means for holding the sample in the vacuum chamber; said support means being arranged at said covering glass for positioning the sample immediately adjacent said covering glass; means for irradiating the sample with an electromagnetic beam including a focusing system arranged externally of said vacuum chamber at said covering glass for focusing the electromagnetic beam on the sample through said covering glass; a mass analyzer disposed in the vacuum chamber; means for extracting particles from the sample and introducing them into the mass analyzer; the improvement comprising a layer of conductive material situated in the vicinity of said support means in the zone of the sample for effecting an even potential distribution in the zone of the sample; said layer being situated between the focusing system and the sample and extending along a face of said covering glass in the path of the beam; said layer being transparent to said beam.

## 4,214,160
## MASS SPECTROMETER SYSTEM AND METHOD FOR CONTROL OF ION ENERGY FOR DIFFERENT MASSES

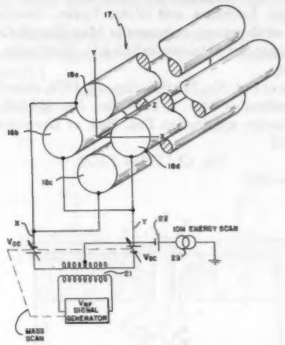
**William J. Fies, Portola Valley, Calif.; Ronald D. Smith, Bovingdon, Fed. Rep. of Germany; John R. Reeher, and Michael S. Story, both of Los Gatos, Calif., assignors to Finnigan Corporation, Sunnyvale, Calif.**

**Filed Mar. 4, 1976, Ser. No. 664,046**

**Int. Cl.[2] H01J *39/34***

**U.S. Cl. 250—292** **3 Claims**

**1**. In a mass spectrometer system having a gas inlet means and an ionizing volume, a multi-pole mass filter having a plurality of electrodes, focusing means for coupling said ionizing volume to said mass filter, and means for applying to said electrodes a mass setting voltage consisting of a combination of a radio frequency voltage, $V_{RF}$, and a dc voltage, $V_{DC}$, of increasing amplitude to select an ion fragment of a predetermined mass, such applying means also including means connected to said electrodes and responsive to said mass setting voltage for adjusting the ion energy of said selected ion in accordance with the mass of said ion by changing the potential




differences between said ionizing volume and the axis potential of said electrodes.

## 4,214,161
## APPARATUS FOR RADIOCHROMATOGRAPHIC ANALYSIS OF MIXTURE OF SUBSTANCES CONTAINING COMPONENTS TAGGED BY RADIOACTIVE ISOTOPES

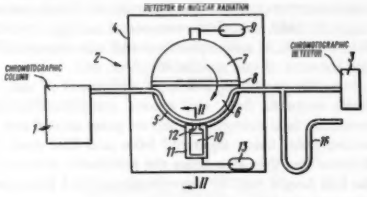
**Viktor L. Talroze; Vladimir D. Grishin, and Boris A. Galushkin, all of Moscow, U.S.S.R., assignors to Institut Khimicheskoi Fiziki Akademii Nauk USSR, U.S.S.R.**

**Filed Jan. 5, 1978, Ser. No. 867,154**

**Claims priority, application Fed. Rep. of Germany, Jan. 24, 1977, 2446411**

**Int. Cl.[2] G01T *1/161***

**U.S. Cl. 250—303** **4 Claims**




**1**. A device for radiochromatographic analysis of mixtures of substances containing components tagged by radioactive isotopes comprising: a chromatographic column; a detector of nuclear radiation connected in series with the outlet of said chromatographic column along the flow of the substance being analyzed; a chromatographic detector connected in series with the outlet of said detector of nuclear radiation along the flow of the substance being analyzed; said nuclear radiation detector including a tubular shaped light-transparent cell, one end of said tube being in fluid communication with said chromatographic column and comprising the inlet of said detector of nuclear radiation, the other end of said tube being in fluid communication with said chromatographic detector and comprising the outlet of said detector of nuclear radiation; a scintillator constituting a solid layer overlying the inner surface of said tube; a heater movable along the length of said tube; a cooler movable along the length of said tube consecutively with said heater; means for moving said heater and cooler consecutively along the length of said tube; a light detector optically connected to said tube and movable therealong; and means for moving said light detector along said tube.

## 4,214,162
## CORPUSCULAR BEAM MICROSCOPE FOR RING SEGMENT FOCUSING

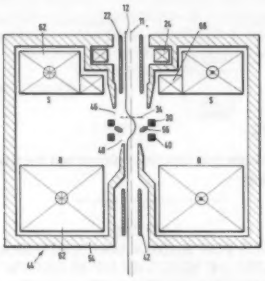
**Walter Hoppe, Lochham, and Dieter Typke, Gauting, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany**

**Continuation of Ser. No. 724,056, Sep. 16, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,005**

**Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541915**

**Int. Cl.[2] H01J *37/26***

**U.S. Cl. 250—311** **6 Claims**



1. In a corpuscular beam microscope having a longitudinal axis on which a specimen holder is located and about which a combined condenser and objective magnetic lens system is symmetrically disposed for producing a composite magnetic field along said axis to cause a corpuscular beam to form an angle of at least 30° with said axis at the location of said specimen holder, the improvement wherein said lens system comprises:

(a) means for producing a first component of said composite magnetic field, said first component having a maximum field strength at a first point on said axis substantially at said location of said specimen holder; and

(b) means for producing a second component of said composite magnetic field, said second component having a maximum field strength at a second point on said axis, said second point being separated from said first point by a distance less than five times the arithmetic mean of half the half height widths, respectively, of said first component and said second component.

## 4,214,163
## METHOD AND APPARATUS FOR CORRECTING ASTIGMATISM IN A SCANNING ELECTRON MICROSCOPE OR THE LIKE

**Takao Namae, and Teruo Someya, both of Akishimashi, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 18, 1978, Ser. No. 970,860**

**Claims priority, application Japan, Dec. 29, 1977, 52-157790**

**Int. Cl.[2] G01M *23/00***

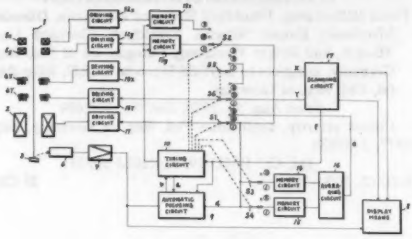
**U.S. Cl. 250—311** **7 Claims**

1. A method for automatically correcting astigmatism in a scanning electron microscope or the like having a focusing lens system for focusing the electron beam on a specimen, and an xy type electromagnetic stigmator for correcting the astigmastism of said focusing lens system, said method comprising:

(a) a step for scanning the electron beam repeatedly on the specimen,

(b) a step for successively and independently changing the excitation current flowing through the x and y direction coils constituting the xy type stigmator,

(c) a step for converting the signal emanating from the specimen into a signal indicative of the electron beam diameter in the scanning direction during each scan, and



(d) a step for locking the excitation current flowing through the x and y direction coils when the conversion signal reaches a value indicative of the minimum beam diameter.

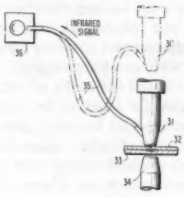
## 4,214,164
## CONTROL OF SPOT WELD QUALITY BY INFRARED THERMAL SENSING

**Alan C. Traub, Framingham, and Riccardo Vanzetti, Walpole, both of Mass., assignors to Vanzetti Infrared & Computer System Incorporated, Canton, Mass.**

**Filed Jul. 19, 1978, Ser. No. 926,055**

**Int. Cl.[2] G01J *1/00***

**U.S. Cl. 250—338** **4 Claims**




1. A method of automatically operating a spot welder comprising the steps of:

during each weld measuring the temperature produced within one of a pair of welding tips to produce a thermal signal proportional to the temperature of the weld instant by instant;

sampling said thermal signal and digitally storing a value corresponding to the sampled thermal signal produced for a good weld; and

thereafter, comparing said thermal signal with a signal proportional to the stored digital value to generate a control signal for controlling the welding power of said spot welder during each weld.

## 4,214,165
## PYROELECTRIC IR DETECTOR WITH SIGNAL CAPACITIVELY COUPLED TO AN OUTPUT CIRCUIT

**Charles K. Asawa, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Feb. 21, 1979, Ser. No. 13,705**

**Int. Cl.[2] G01J *1/00***

**U.S. Cl. 250—338** **6 Claims**

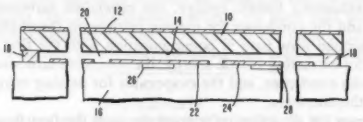
1. A pyroelectric detector including, in combination:

(a) a pyroelectric substrate having first and second major surfaces, with said first and second major surfaces adapted to receive chopped incoming infrared radiation;

(b) a continuous infrared absorbing metal electrode member disposed on said first major surface for receiving chopped incoming infrared radiation and conducting same to said pyroelectric substrate for developing voltages thereacross

in response and proportional to photon energy received; and

(c) means including a plurality of discrete metallic electrode members displaced from and capacitively coupled to said




second major surface of said pyroelectric substrate for supporting said pyroelectric substrate and minimizing heat transfer from said substrate, whereby pyroelectric voltages developed across said substrate are capacitively coupled to and readout from said discrete electrode members.

---

**4,214,166**

## MAGNETIC LENS SYSTEM FOR CORPUSCULAR RADIATION EQUIPMENT

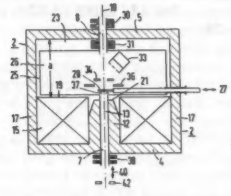
**Isolde Dietrich; Fred Fox, both of Munich; Erwin Knapek, Unterhaching; Karl Nachtrieb, Munich; Reinhard Weyl, Assling; Helmut Zerbst, and Guy Lefranc, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Mar. 28, 1978, Ser. No. 890,922**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726195**

**Int. Cl.² G01N *23/00***

**U.S. Cl. 250—396 ML** **15 Claims**




1. A magnetic lens system for corpuscular radiation equipment operating in a vacuum, which is capable of being set up for transmission type scanning, comprising:

(a) a shield housing of superconducting material provided with openings to allow passage of a corpuscular beam;

(b) a shielding device consisting of one hollow shielding cylinder of superconductive material disposed coaxially with the beam direction axis of the lens system and situated within the shield housing in such a manner that one end is separated from the facing interior surface of the shield housing, thereby defining a cavity within the shield housing;

(c) at least one current carrying lens coil winding, which is arranged about the shielding device and within the shield housing so that its flat side at the cavity end of the shield device further defines the cavity, generating a magnetic field for beam guidance, said shield housing and shielding cylinder guiding said magnetic field within said cavity; and

(d) a vacuum chamber arranged in the cavity to receive an object to be examined.

**4,214,167**

## DEVICE FOR PROTECTION OF THE GONADS

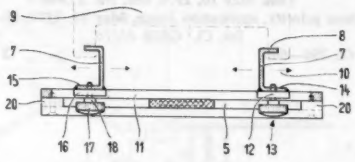
**Ernst-August Gäde, Annastrase 10, Limburg, Fed. Rep. of Germany**

**Filed Aug. 29, 1978, Ser. No. 937,862**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 7727061[U]**

**Int. Cl.² G21F *3/00***

**U.S. Cl. 250—515** **7 Claims**




4. A device for protection of gonads in x-ray diagnosis comprising a retaining frame for fastening to the collimator of an x-ray diagnosis instrument by means of insert strips, said retaining frame having means for receiving a movable support strip of material that is permeable to x-rays and which supports a member of material that is impermeable to x-rays, a plurality of insert strips for fastening said retaining frame to said collimator and means disposing said insert strips on said frame so that the relative position of said insert strips with respect to each other can be adjusted whereby the protective device can be fastened to different x-ray diagnosis instruments.

---

**4,214,168**

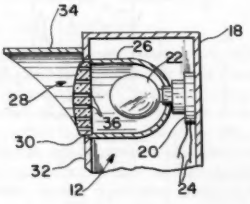
## TRAFFIC LIGHT AND MOTOR VEHICLE TAILLIGHT LENSES

**Thomas S. Kulka, 200 Film Bldg., 2108 Payne Ave., Cleveland, Ohio 44114**

**Continuation of Ser. No. 727,662, May 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 563,322, Mar. 31, 1975, abandoned. This application Sep. 12, 1978, Ser. No. 941,683**

**Int. Cl.² B60Q *1/00***

**U.S. Cl. 362—311** **17 Claims**




1. A signal device of the type in which at least one light transmitting means is provided to emit a visual signal to motorists, the improvement comprising lens means associated with and covering said light transmitting means, said lens means being transparent or translucent and of a desired color and including at least two perforations extending entirely through said lens means perpendicular to the plane of said lens means and being uncovered at the front surface of the lens means, said perforations being arranged in a predetermined pattern and being of sufficient dimensional area so as to visually interrupt light projected horizontally by said light transmitting means through said lens means, whereby the light transmitted through said lens means is of such desired color where no perforations appear and is of the color of said light transmitting means in the perforated area in accordance with said pattern, thereby facilitating recognition of the signal by motorists by

providing a constantly changing light pattern as a motorist approaches the signal device.

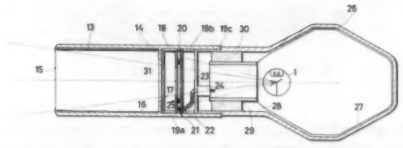
---

**4,214,169**

## DEVICE FOR DETECTING AMOUNT OF X-RAY RADIATION

**Toshihiro Hotta, Misukinoshitayashiki, and Takao Makino, Hikone, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan**

**Filed May 10, 1979, Ser. No. 37,498**
**Claims priority, application Japan, May 11, 1978, 53-56245**
**Int. Cl.³ G03B *41/16***
**U.S. Cl. 250—505** **2 Claims**



1. A device for detecting an X-ray irradiation amount characterized in that the device comprises connecting a closed case capable of interrupting an X-ray transmission to the other end of a cover cylinder open at one end to the patient side, disposing a light conducting cylinder at the connection between said cover cylinder and said case, said light conducting cylinder condensing and leading the X-rays irradiated from the X-ray tube inside said case exclusively into said cover cylinder, and disposing in said cylinder a means for converging X-rays to be projected from said one end of said cylinder and a means for detecting irradiated X-ray beams.

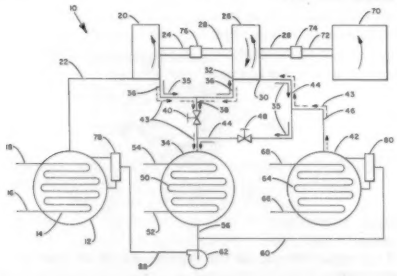
---

**4,214,170**

## POWER GENERATION-REFRIGERATION SYSTEM

**Louis H. Leonard, Cranberry Lake, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Oct. 12, 1978, Ser. No. 950,887**
**Int. Cl.² F02G *3/00***
**U.S. Cl. 290—1 R** **8 Claims**



1. A power generation-refrigeration system comprising:
first means for transferring heat from a source thereof to a refrigerant;
first means for extracting kinetic energy from the heated refrigerant;
means for passing refrigerant between the first heat transferring means and the first means for extracting kinetic energy;
a reversible turbomachine having a compressor mode of operation for compressing refrigerant passing therethrough and a turbine mode of operation for extracting further kinetic energy from the heated refrigerant;
a condenser for condensing the refrigerant;
means for passing refrigerant between the condenser and the first heat transferring means;
an evaporator for transferring heat from a heat transfer medium to the refrigerant to cool the heat transfer medium and evaporate the refrigerant;
a first flow path in communication with the first means for extracting kinetic energy, the reversible turbomachine, and the condenser for passing refrigerant therebetween;
a second flow path in communication with the first means for extracting kinetic energy, the reversible turbomachine, the condenser, and the evaporator for passing refrigerant therebetween;
means for directing refrigerant through the first flow path when the reversible turbomachine is in the turbine mode and through the second flow path when the reversible turbomachine is in the compressor mode;
power means for generating power;
first connecting means for connecting the reversible turbomachine and the power means and having a power generation position wherein energy extracted from the refrigerant by the reversible turbomachine is transmitted to the power means to generate power; and
second connecting means for connecting the first means for extracting kinetic energy and the reversible turbomachine and having a refrigeration position wherein energy extracted from the refrigerant by the first means for extracting kinetic energy is transmitted to the reversible turbomachine to compress refrigerant passing therethrough, and a power generation position wherein energy extracted from the refrigerant by the first means for extracting kinetic energy is transmitted to the reversible turbomachine to assist the generation of the power.

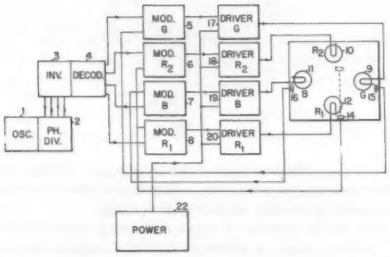
---

**4,214,171**

## PLURAL PHASE PULSED POWER SUPPLY

**Robert P. Gyori, Studio City, Calif., assignor to De luxe General, Incorporated, Los Angeles, Calif.**

**Continuation of Ser. No. 742,809, Nov. 18, 1976, abandoned.**
**This application Feb. 27, 1978, Ser. No. 882,291**
**Int. Cl.² G05B *13/02***
**U.S. Cl. 307—39** **12 Claims**




3. A plural phase power supply for individually supplying regulated electric power to plural phase loads, comprising;
(a) electric oscillatory means (**1**) for continuously producing successive cycles of electrical energy.
(b) phase-divider means (**2**) for producing plural series of pulses in separate circuits from said successive cycles of electrical energy, said phase-divider means electrically connected to said electric oscillatory means for actuation thereby,
(c) Plural pulse-width modulator means (**5-8**) each connected in the circuit of a separate said plural phase load and to said phase-divider means to accept one of said series of plural pulses for altering the time duration of the pulses thereof,
(d) plural control means (**14-16**) each connected to a said plural pulse-width modulator means to control the pulse

width supplied by that pulse-width modulator in accordance with the output supplied by said control means,

(e) driver means (17–20) individually connected to said pulse-width means to control the level of power regulated by said pulse-width modulator means, and

(f) power supply means (22) individually connected to each said driver means to provide an electrical energy output thereto that is individually altered by each said pulse-width modulator means according to the control thereover exerted by the corresponding said control means.

---

**4,214,172**

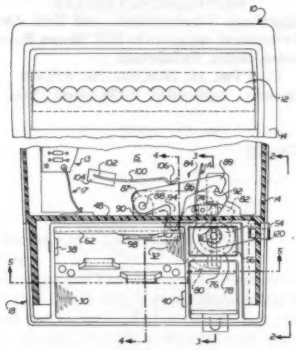
## INTERLOCK FOR POWER SOURCES IN DATA PROCESSING APPARATUS

**Gary G. See, Chagrin Falls, Ohio, assignor to Telxon Corporation, Bath, Ohio**

**Filed Feb. 15, 1979, Ser. No. 12,399**

**Int. Cl.[2] H02J *9/00*; E05B *65/46***

**U.S. Cl. 307—150** **15 Claims**



**14.** A hand held electronic data processing device including electrical circuitry adversely affected by removal of electric power therefrom, a housing, separate first and second electric power sources each adapted to be connected in said housing and selectively removable therefrom, means for coupling electric power from said first and second electric power sources, respectively, to said electrical circuitry, selectively removable means for holding said first and second electric power sources, respectively, in said housing, and means carried in said housing and coacting between said respective first and second electric power source holding means for lockingly engaging said second power source holding means to restrain removal of said second electric power source from the housing when the first electric power source is removed from said housing.

---

**4,214,173**

## SYNCHRONOUS BINARY COUNTER UTILIZING A PIPELINE TOGGLE SIGNAL PROPAGATION TECHNIQUE

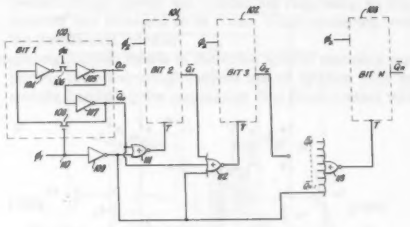
**Jay Popper, New York, N.Y., assignor to Standard Microsystems Corp., Hauppauge, N.Y.**

**Filed Mar. 3, 1978, Ser. No. 883,285**

**Int. Cl.[2] H03K *21/34, 23/30***

**U.S. Cl. 307—224 C** **3 Claims**

**1.** A synchronous, high speed binary counter, comprising a plurality of counter stages, each counter stage having a first output state and a second output state, each counter stage experiencing a state change in response to a toggle signal applied thereto and subject to transient toggle signals when a change of state signal is not applied thereto, means for applying the toggle signal to one of the counter stages, a first MOS device connected between successive ones of the counter stages, said device being responsive to the first state of the preceding counter stage for transferring the toggle signal applied to the preceding counter stage to the next succeeding counter stage and responsive to the second state of the preceding counter stage for blocking the transfer of the toggle signal, a second MOS device connected between the output of said first MOS device and ground and responsive to a non-toggle



clock signal applied thereto for grounding any transient toggle signals to the counter stages, and a third MOS device also connected between the output of said first MOS device and ground and responsive to the second state of the preceding counter stage for grounding the toggle signal input to the next succeeding counter stage when said first MOS device is to be in said blocking condition.

---

**4,214,174**

## VOLTAGE MULTIPLIER EMPLOYING CLOCK GATED TRANSISTOR CHAIN

**John F. Dickson, Long Buckby, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland**

**Filed Mar. 22, 1978, Ser. No. 888,990**

**Claims priority, application United Kingdom, Mar. 25, 1977, 12716/77**

**Int. Cl.[2] G11C *11/40*; H03K *7/02***

**U.S. Cl. 307—229** **8 Claims**

**1.** A voltage multiplier circuit arrangement, comprising a plurality of transistors having respective main electrodes cascade connected in a series, each transistor having a control electrode connected to a respective junction formed by the main electrodes of two further transistors in said series, said two further transistors being connected adjacent to and toward the output side of said each transistor, said arrangement further comprising first and second input lines arranged to have an alternating voltage applied between them, capacitor means for connecting each said junction to one of the first and second input lines, junctions which are immediately adjacent to one another in the series being respectively connected to different ones of the first and second input lines.

---

**4,214,175**

## HIGH-PERFORMANCE ADDRESS BUFFER FOR RANDOM-ACCESS MEMORY

**John Y. Chan, Belmont, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.**

**Filed Sep. 22, 1978, Ser. No. 944,687**

**Int. Cl.[2] H03K *5/02, 3/353*; G11C *7/06, 8/00***

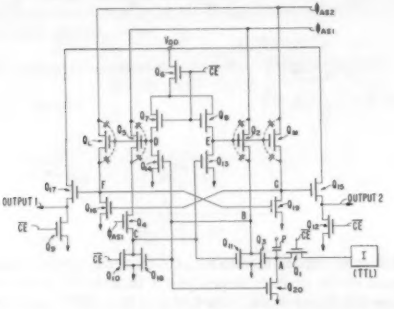
**U.S. Cl. 307—264** **5 Claims**

**1.** A buffer circuit apparatus having a high-low state input and a pair of high-low state outputs, comprising:

means for initially providing that both outputs are in their low states;

means for sampling the input to determine the state of said input;

first output determining means for providing that subsequent to said input being sampled as of one state, one of the outputs is driven to its high state after a substantially




certain period of time subsequent to said sampling, with the other output remaining in its low state; and

second output determining means for providing that subsequent to said input being sampled as of the other state, the other output is driving to its high state in a period of time less than said substantially certain period of time, with the one output being held in its low state upon the other output being driven to its high state.

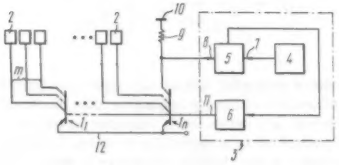
---

**4,214,176**

## STABILIZED CURRENT SOURCES NETWORK

**Jury K. Kushner, ulitsa Khersonskaya, 25, Kv. 62, Moscow, U.S.S.R.**

**Filed Sep. 22, 1978, Ser. No. 944,984**
**Int. Cl.² H03J *1/12***
**U.S. Cl. 307—297** **2 Claims**




1. A stabilized current sources network for feeding electronic elements comprising:

n multiple collector transistors each having m collectors;

a load resistor; a first lead and a second lead of said load resistor;

a stabilization unit means for comparing any voltage on said load resistor with a reference voltage and for amplifying the difference signal between said voltages, said stabilizing unit means having an input and an output;

a first common bus;

a second common bus;

said m collectors of each of said multiple collector transistors, coupled to said electronic elements;

said emitters of said multiple collector transistors, coupled to said second common bus;

one of said m collectors of any one of said n multiple collector transistors, coupled to one of said leads of said load resistor;

said second lead of said load resistor coupled to said first common bus;

said input of said stabilization unit means coupled to said first lead of said load resistor;

said output of said stabilization unit means coupled to bases of said n multiple collector transistors.

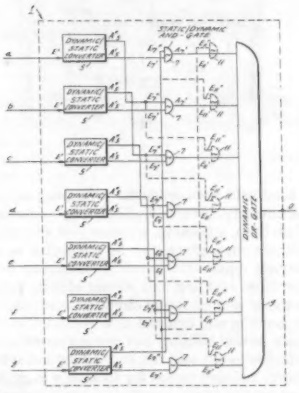
---

**4,214,177**

## MONITORING CIRCUIT

**Werner Raggenbass, Schwerzenbach, and Kurt Zwar, Brugg, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland**

**Filed Feb. 16, 1978, Ser. No. 878,479**
**Claims priority, application Switzerland, Mar. 4, 1977, 2700/77**
**Int. Cl.² H03K *5/18***
**U.S. Cl. 307—355** **14 Claims**




1. A monitoring circuit for detecting the simultaneous deviation of m out of n a.c. input signals from a predetermined set of signal characteristics, wherein n and m are integers and n is greater than m, said circuit comprising:

(A) n functional units, each of said functional units including an a.c. input, at least one d.c. input, an a.c. output and a d.c. output;

(B) means for connecting a different one of said n a.c. input signals to said a.c. input of each of said functional units such that each of said functional units is associated with a different one of said a.c. signals; and

(C) logic circuit means connected to said functional units for generating:

(1) a d.c. output signal at least whenever m out of n input signals have maxima and minima which both lie above or both lie below a predetermined signal range corresponding to at least one of said predetermined set of signal characteristics; and

(2) an a.c. output signal whenever all of said n input signals have maxima and minima which respectively lie above and below said predetermined signal range.

## 4,214,178

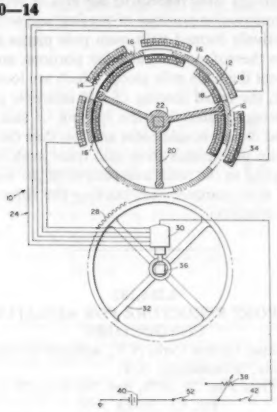
## ROTATING ELECTROMAGNETIC SOLENOID MOTOR

Richard E. Tippner, 2050 NE. 39th St., Apt. 109 South, Lighthouse Point, Fla. 33069

Continuation of Ser. No. 574,751, May 5, 1975, abandoned, Continuation-in-part of Ser. No. 278,721, Aug. 8, 1972, abandoned. This application Nov. 2, 1978, Ser. No. 956,601

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—14 6 Claims



1. An electric motor unit comprising:

(a) A frame;

(b) a plurality of at least five electro-magnetic solenoids of equal axial length spaced apart on the frame in a circular pattern and including a core passageway, said solenoids being grouped together in an array with uniform separations in the array which are smaller than the length of the solenoid, the portion unoccupied by solenoids being substantially greater than the length of a solenoid;

(c) a rotatable circular armature coupled to the frame and having a plurality in excess of the number of solenoids of spaced, magnetizable elements separated by non-magnetizable elements, said elements being arranged to pass through said core passageway;

(d) means for electrically energizing said solenoids one at a time and in sequence so that during one revolution each solenoid is energized the same number of times as there are magnetic segments in the armature;

(e) an output shaft coupled to said armature; each of said magnetizable elements being equal in length to said solenoid axial length; said energizing means being so arranged that a solenoid is energized when the magnetizable element is two-thirds into the solenoid and after said magnetic element has been pulled in the remaining one-third, said solenoid is de-energized and the next adjacent solenoid is energized.

---

## 4,214,179

## ROTOR IMBALANCE DETECTOR FOR A CENTRIFUGE

Kenneth E. Jacobson, Fremont, and William S. Gutierrez, San Francisco, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 15, 1979, Ser. No. 20,894

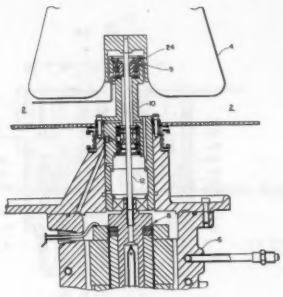
Int. Cl.[2] H02K *11/00;* B04B *9/02;* H01H *35/02*

U.S. Cl. 310—68 B 5 Claims

1. A centrifuge having a rotor chamber and a motor mounted beneath the chamber; a drive spindle assembly extending from the motor to the rotor chamber; a drive spindle mounted in the drive spindle assembly extending into the chamber, the drive spindle being electrically connected to ground; a rotor adapted to be mounted on the drive spindle; and an improved rotor imbalance detector comprising:

a rotatable electrically conducting ring supported in the drive spindle assembly, surrounding and concentric with the drive spindle but spaced therefrom a predetermined amount so that the conducting ring is only contacted by the spindle when the spindle becomes imbalanced to a predetermined extent, the conducting ring being so constructed and arranged as to rotate when contacted with the imbalanced spindle;

insulating support means in the drive spindle assembly supporting the conducting ring in a spaced relation with the spindle, insulating the conducting ring from contact with



the spindle assembly, and yet permitting rotational movement of the conducting ring with respect to the insulating support means;

means for de-energizing the power supplied to the motor; and

a conductive lead, having a portion thereof in electrical contact with the conducting ring, for grounding an electrical signal from the de-energizing means when an imbalanced rotor causes the electrically grounded spindle to move out of its normal axis of rotation and contact the conducting ring, the lead being in sliding contact with the conducting ring so that the lead remains in continuous contact with the conducting ring.

---

## 4,214,180

## MINIATURE ELECTRIC MOTOR EMPLOYING A CONVERSION MECHANISM FOR LINEAR MOVEMENT

Tomohisa Kuwako, Anjo; Takashi Ozaki, and Yoshitaka Iwase, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 23, 1978, Ser. No. 889,449

Int. Cl.[2] H02K *7/00*

U.S. Cl. 310—80 5 Claims

1. A miniature electric motor with a mechanism for converting rotational motion into linear motion, comprising:

(a) a housing having a first and a second section;

(b) a shaft movably supported in said housing for movement only axially thereof;

(c) motor members which are annular flat bodies supported within said housing in coaxial relation to said shaft;

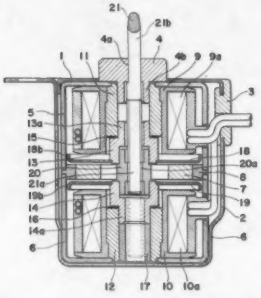
(d) an annular permanent magnet stator stationarily supported within said housing in coaxial relation to said shaft and magnetized for providing alternating north and south poles at equal angular spacings therearound;

(e) annular exciting coil members supported within said housing in coaxial relation to said annular flat body rotor members;

(f) yoke members made of magnetic material, said yoke members being positioned relative to said annular exciting coil members, said stator, and said annular flat body rotor members so that a magnetic flux generated by said annular

exciting coil members when said annular exciting coil members are energized, forms a magnetic loop with said pole means for rotating said rotor in a predetermined direction about said shaft;

(g) motion translating means located within said housing and interposed between said shaft and said rotor for transmitting said rotational motion of said annular flat body rotor members to said shaft to cause said shaft to undergo motion in a linear direction which is parallel to the longitudinal axis of said shaft, said motion translating means further comprising, said shaft having an helically threaded portion and an unthreaded portion, rotor boss members attached at each end thereto and having their interior helically threaded to engage said helically threaded portion of



said shaft for causing said shaft to undergo said linear motion upon movement of said annular flat body rotor members;

(h) linear motion means located at said first section of said housing for engaging with said unthreaded portion of said shaft for causing said shaft to move only axially in relation to said housing; and

(i) a friction preventing sleeve member separate from said motion translating means and located in said second section of said housing and lining a space in said second section of said housing into which said shaft is displaced upon movement in one direction of said annular flat body rotor means for reducing wear due to friction upon contact of said shaft with said friction preventing sleeve member.

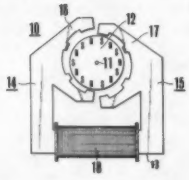
---

**4,214,181**

## SELF-STARTING MINIATURE SYNCHRONOUS MOTORS

**Yukihiro Nagahori, Kawasaki, Japan, assignor to Jeco Co., Ltd., Kawasaki, Japan**

**Filed Aug. 8, 1977, Ser. No. 822,687**
**Int. Cl.[2] H02K *21/00***
**U.S. Cl. 310—162** **6 Claims**



1. A self-starting miniature synchronous motor comprising a rotor provided with a plurality of equally spaced poles of alternate polarities; the number of the pole pairs n being equal to or larger than 5, where n represents an odd integer, a pair of first and second stators having opposed semicircular portions each of the same diameter and both stator diameters being greater than the diameter of the rotor and arranged to surround the rotor; a single exciting coil for exciting said pair of stators; the centers of the semicircular portions of said pair of stators being located at points displaced from the axis of rotation of said rotor such that said semicircular portions will be point symmetrical with respect to the axis of rotation of the rotor, the semicircular portions of the first and second stators being respectively formed with main pole pieces at the adjacent portions thereof, notches at other portions, and interpole pieces adjacent the main pole pieces which are located closest to said rotor, the radial spacing of said interpole pieces from said rotor being greater than the spacing of said main pole pieces located closest to said rotor and less than the spacing of the other main pole pieces from said rotor such that a large torque is applied to the rotor irrespective of the angular position thereof thus positively self-starting the rotor without a dead center condition.

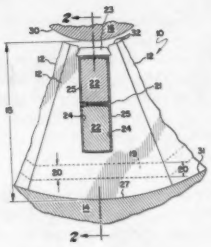
---

**4,214,182**

## SUPPORT STRUCTURE FOR ARMATURE CONDUCTORS

**Thomas A. Keim, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 20, 1978, Ser. No. 917,170**
**Int. Cl.[2] H02K *1/00***
**U.S. Cl. 310—216** **16 Claims**



1. In an electrodynamic machine having an annular cylindrical ferromagnetic stator core and a cylindrical rotor rotatably mounted coaxially therewith and separated therefrom by an annular cylindrical air gap, the improvement comprising:

a plurality of insulated longitudinally-extending armature conductors uniformly spaced circumferentially within said air gap;

a plurality of electrically nonconducting means for supporting said armature conductors at spaced locations therealong relative to said stator core, each of said supporting means comprising a plurality of generally coplanar wedge-shaped composite members;

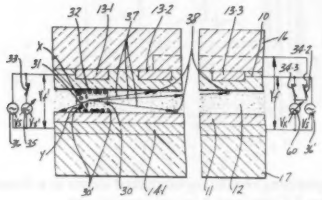
each of said members comprising a stack of spaced mounting teeth and spacer members interleaved therewith, each said stack having a slot therethrough for insertion of the conductors being supported, said mounting teeth and said spacer members being bonded to said conductors;

said spacer members each having a discontinuity generally transverse to a radius passing through said conductors defining a hole between adjacent mounting teeth, the mounting tooth area axially adjacent each said discontinuity, respectively defining a boundary of each hole, respectively providing a spring section in each of said teeth, respectively to allow axial expansion of said conductors without relative slipping between said mounting teeth and said conductors.

## 4,214,183
## MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING IMPROVED VOLTAGE CHARACTERISTICS

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 293,817, Oct. 2, 1972, Pat. No. 4,114,064, which is a continuation-in-part of Ser. No. 60,376, Aug. 3, 1970, abandoned. This application Apr. 25, 1978, Ser. No. 900,033
Int. Cl.[2] H01J *1/90, 61/30, 61/35*
U.S. Cl. 313—221 3 Claims



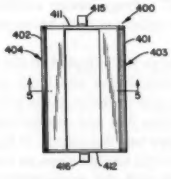
1. As an article of manufacture, a dielectric charge storage body for a multiple gas discharge device, said dielectric body being selectively enriched with at least one element selected from the group consisting of ribidium and francium, in an amount sufficient to provide gas discharge device operating voltages which are substantially uniform and which do not significantly change with time after a period of aging and said body having a gas contacting charge storage side surface and an electrode contacting side surface.

---

## 4,214,184
## GETTER COMPRISING U-SHAPED, PARALLEL, LINEAR CHANNELS CONTAINING GETTER MATERIAL

Paolo D. Porta, and Elio Rabusin, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation of Ser. No. 774,426, Mar. 4, 1977, Pat. No. 4,134,041. This application Jun. 16, 1978, Ser. No. 916,213
Claims priority, application Italy, May 12, 1976, 23184 A/76
Int. Cl.[2] H01J *29/84, 31/00*
U.S. Cl. 313—481 3 Claims



1. A color television picture tube comprising:

(I)

(A) a glass cone portion;

(B) a glass window portion;

(C) a metal screening cone located within the volume defined by the glass cone portion and the glass screen portion, at least a major part of the metal screening cone being distanced away from the glass cone portion; and

(D) an evaporable getter device comprising two parallel linear channel holders having U-shaped cross-sections, each containing a source of evaporable getter material, each linear holder having an inner facing wall, two side walls and two end walls, the outer portion forming the opening of the cross-sectional U-shape, linear holders being joined to each other by metal strips connecting the ends of each of the linear holders to form a closed loop substantially lying in a single plane, such that the openings of the linear holders are facing substantially outwards and away from each other, said metal connecting strips further comprising support legs for mounting the getter device;

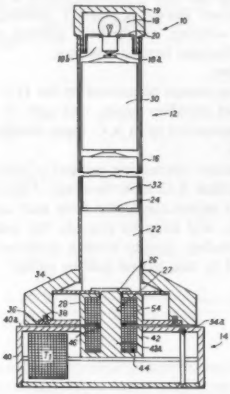
(II) with the provisos that (a) the evaporable getter device is mounted on the metal screening cone by means of the support legs at a point between the metal screening cone and the glass cone portion, and (b) the evaporable getter device is oriented in such a way as to evaporate the getter material in a direction substantially parallel to a line formed by the nearest intersection of the glass cone portion and the glass window portion.

---

## 4,214,185
## LIGHT SOURCES

Alan G. Breeze, 76 Greenfields Ave., Alton, Hampshire, England

Filed Oct. 10, 1978, Ser. No. 949,497
Int. Cl.[2] H05B *37/00*
U.S. Cl. 315—86 11 Claims



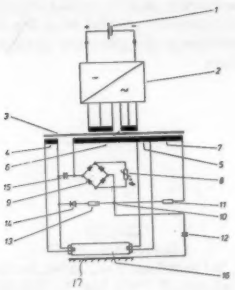
1. A light source comprising a lamp bulb, an electrical power source for illuminating the lamp bulb, a housing for containing said lamp bulb and said power source, a surface for supporting said housing, switch means for selectively coupling the power source to said bulb, control means for controlling said switch means, said control means being coupled to and operated by an a.c. supply such that when said housing is mounted on the supporting surface and the a.c. supply is maintained, said power source is disconnected from the bulb, and when the a.c. supply is interrupted, said power source is connected to illuminate the bulb, means for securing said housing on said supporting surface, the securing means comprising transformer means having a magnetically attractable component and a magnetically attracting component, one of the components mounted on said supporting surface and the other of said components mounted in said housing, means coupling the a.c. supply to said transformer means to produce magnetic forces between said components, such magnetic forces being sufficient to secure said housing on said supporting surface but allowing manual separation of said housing from said supporting surface whether the a.c. supply is maintained or interrupted.

4,214,186

## CIRCUIT FOR TRANSISTOR BALLASTS FOR THE GENTLE IGNITION OF FLUORESCENT LAMPS

Peter K. Kreutzer, Bettengasse 20, D-7750 Konstanz, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 965,193
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808261
Int. Cl.[2] H05B *41/14, 41/26*
U.S. Cl. 315—102 7 Claims



1. A ballast circuit for a pre-heat type fluorescent lamp comprising a voltage source means including a transformer,

said transformer having a primary winding, a secondary operating winding, an auxiliary ignition winding and at least one filament heating winding,

rectifier means,

ballast resistor means connected to the D.C. output terminals of said rectifier means, one end of said operating winding connected to an A.C. input terminal of said rectifier means,

impedance means connecting one end of said ignition winding to the other A.C. input terminal of the rectifier means,

and capacitor means connected from said other A.C. input terminal to said lamp to provide the voltage from the ignition winding thereto after a predetermined time as determined by said ballast resistor means.

---

4,214,187

## ION SOURCE PRODUCING A DENSE FLUX OF LOW ENERGY IONS

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 30, 1979, Ser. No. 7,895
Claims priority, application France, Feb. 3, 1978, 78 03098
Int. Cl.[2] H01J *27/00*
U.S. Cl. 315—111.8 6 Claims

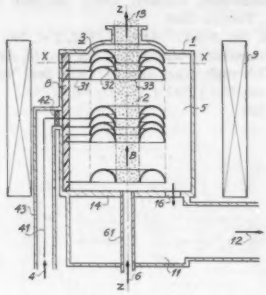
1. An ion source producing a dense flux of low energy ions, comprising:

a vacuum enclosure,

a microwave circuit placed in said vacuum enclosure, in which an electromagnetic wave is able to propagate along a direction ZZ, comprising generally ring-shaped conducting elements which are arranged periodically so as to be roughly centred on said direction ZZ,

inlet means for a neutral gas at one end of said microwave circuit, said gas being at least partially ionized in the centre part on the rings by means of the energy given to it by said electromagnetic wave, thus forming a plasma,

means for guiding said plasma along the direction ZZ,



means for pumping remaining unionized atoms in a direction normal to ZZ along said microwave circuit.

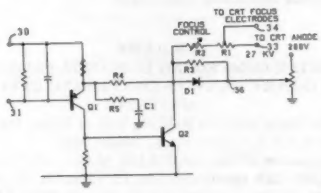
---

4,214,188

## DYNAMIC FOCUS FOR A CATHODE RAY TUBE

Michael P. Bafaro, Park Ridge, and James J. Parker, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1978, Ser. No. 908,297
Int. Cl.[2] H01J *29/58*
U.S. Cl. 315—382 7 Claims




1. In a cathode ray tube device for displaying information by means of a raster:

a cathode ray tube having an anode and a focus electrode;

an input source of AC voltage having variations of substantially parabolic waveform at both horizontal and vertical rates;

a source of high voltage DC coupled to the anode;

transistor means for amplifying said input AC voltage and coupled to ground and to the ac input source; and

resistive means including first and second elements, the first element coupled between the source of high voltage and the focus electrode, the second element coupled between the focus electrode and the transistor means, the first element having a resistance substantially greater than that of the second element.

---

4,214,189

## REGULATED DEFLECTION CIRCUIT

Walter Böhringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,174
Claims priority, application United Kingdom, Jan. 23, 1978, 2658/78
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 7 Claims

1. A regulated deflection circuit, comprising:

a deflection circuit including at least a first deflection switch

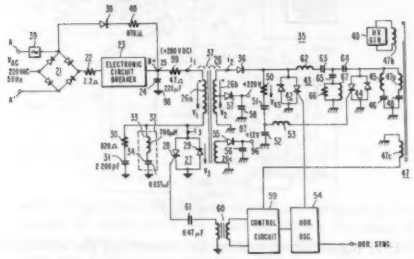
for generating first and second intervals within each deflection cycle;

a source of operating voltage;

an input transformer including first and second windings magnetically loosely coupled to each other, for providing a substantial leakage inductance to the flow of current in said transformer;

bidirectional switching means series coupled with said first winding and said source of operating voltage for controlling the flow of current in said first winding;

second switching means coupled to said secondary winding and said first deflection switch, the polarities of said first



and second windings and of said second switching means such as to provide substantially simultaneous conduction of said bidirectional and second switching means;

control means coupled to said bidirectional switching means and responsive to an energy level of said deflection circuit for switching said bidirectional switching means into conduction at a variable instant within one of said first and second intervals for providing regulation;

a resonant circuit coupled to said bidirectional switching means for coupling a substantially complete cycle of resonant current through said bidirectional switching means for commutating off said bidirectional switching means.

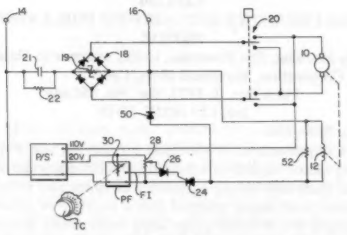
---

**4,214,190**

## TENSION CONTROLLING

**Allen E. Ottoson, Westboro, Mass., assignor to Vee Arc Corporation, Westboro, Mass.**

**Filed Jan. 19, 1978, Ser. No. 870,630**
**Int. Cl.[2] H02P *3/14***
**U.S. Cl. 318—356** **1 Claim**



1. Field control circuit for the field coil of a shunt motor in which armature current is held substantially constant, comprising,

line means for connecting the motor field coil to an A.C. source and means for suppressing externally induced voltage transients in the armature and field circuits,

thyristor means in the line means for rectification and power control based on phase angle of firing,

gating means for the thyristor comprising a solid state comparator with first input means thereto for setting a reference level and second input means thereto providing a ramp form current input rising up to and above said reference level to produce a gating pulse, means for adjusting the ramp slope to control time of input rise to the reference level, means for protecting the comparator from heat produced within the circuit,

means for adjusting the reference level to compensate the tolerances of the adjusting and second input means so that the ramp adjusting means from control circuit to control circuit are equally calibrated despite such tolerances to provide uniform control,

and wherein said solid state comparator comprises a programmable unijunction transistor (P.U.T.), said second input means comprise a capacitor and charging circuit therefor connected to said P.U.T. anode providing said ramp for a current input to the anode of the transistor by discharge of the capacitor, said reference level means comprising a variable voltage source connected to the gate of the P.U.T.

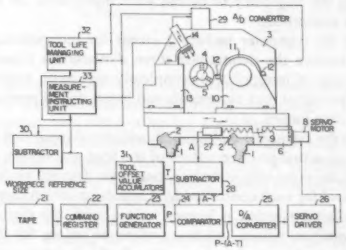
---

**4,214,191**

## SYSTEM FOR AUTOMATIC MANAGEMENT OF TOOL LIFE

**Toshiaki Watanabe, and Hideo Yuhara, both of Kasugai, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan**

**Filed Sep. 21, 1977, Ser. No. 835,362**
**Claims priority, application Japan, Sep. 29, 1976, 51/117433**
**Int. Cl.[2] G05B *13/00***
**U.S. Cl. 318—561** **4 Claims**



1. An automatic management system for tool life in a numerical machine tool including a tool post, a turret head journaled in said tool post for carrying a plurality of equally circumferentially spaced cutting tools of the same shape having their cutting edges disposed on the same circumference, a chuck releasably grasping a workpiece, a measuring unit responsive to a measurement instructing signal for automatically measuring the radial dimension of the workpiece grasped by said chuck, and means for turning said turret head, said system comprising:

subtracting means for subtracting a signal representing the reference radial dimension of said workpiece from a signal representing the radial dimensions of said workpiece measured by said measuring unit thereby providing an output representing the amount of tool offset;

tool life managing means for removing a radial deviation component due to heat from the amount of tool offset provided by the output of said subtracting means thereby accumulating solely a tool wear component, said tool life managing means actuating the turret head turning means to exchange a fresh one for a used one of said cutting tools when the accumulated value attains a preset value; and

measurement instructing means for applying the measurement instructing signal to said measuring unit at the time determined by the output of said subtracting means.

## 4,214,192

## PATH CONTROL APPARATUS FOR THE COMPUTER DIRECTED CONTROL OF A NUMERICALLY CONTROLLED MACHINE TOOL

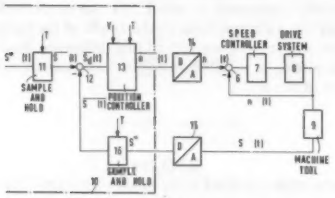
Günter Brömer, Erlangen-Spardorf; Horst Gose; Klaus-Rüdiger Hoffmann, both of Erlangen, and Christian Seeliger, Grossenseebach b. Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,423

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659090

Int. Cl.[2] G05B *19/24*

U.S. Cl. 318—573 1 Claim




1. In a path control apparatus for the computer directed control of a numerically controlled machine tool with controlled drives in the feed axes, wherein the computer determines the trajectory to be run from input data, the improvement comprising:

(a) the computer including means for interpolating which resolve the determined three dimensional trajectory by way of interpolation completely into axial, velocity proportional feed increments and forms digital position reference values,

(b) the computer including an additional input unit for digital actual position values of the feed axis drives, and

(c) the computer including means for discrete position control for each controlled feed axis drive which compare the digital position reference values with the digital actual position values and from reference values for the speed control loop of the respective feed axis drive comprising:

(1) a first difference forming and sampling means for converting a digital position reference value ($S_{soll}(t)$) into a discrete position reference value differences ($\Delta S_{soll}(\nu T)$), and a second difference forming and sampling means for converting an actual digital value ($S_{ist}(t)$) into a discrete actual value position difference ($\Delta S_{ist}(\nu T)$),

(2) comparison means having as inputs the discrete position reference value difference ($\Delta S_{soll}(\nu T)$) and the discrete actual position value difference ($\Delta S_{ist}(\nu T)$) and forming a discrete trailing distance difference ($\Delta S_d(\nu T)$),

(3) summing means having as an input the discrete trailing distance difference ($\Delta S_d(\nu T)$) and forming a discrete trailing distance ($S_d(\nu T)$),

(4) position controlling means having as an input the trailing distance ($S_d(\nu T)$) for forming a discrete speed reference value ($n_{soll}(\nu T)$), and

(5) zero-order holding means having as an input the discrete speed reference value ($n_{soll}(\nu T)$) for forming a discrete, stored speed reference value ($n_{\overline{soll}}(t)$) for delivery to the speed control loop of the respective feed axis drive; and

(d) means for synchronously operating said means for discrete position control.

## 4,214,193

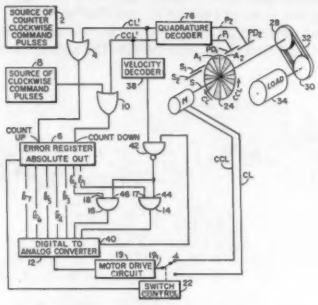
## DIGITAL SERVO ANTI-HUNT CIRCUIT

Martin K. Mason, West Newbury, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 10, 1978, Ser. No. 949,486

Int. Cl.[2] G05B *5/01*

U.S. Cl. 318—611 1 Claim




1. A digital servo system for controlling the rotation of a motor through a predetermined number of angular increments in response to a series of command pulses, comprising

means for counting a series of command pulses,

a motor,

means for producing a number of position pulses proportional to the number of angular increments through which said motor has rotated,

means for deriving a digital signal representing the difference between the number of command pulses and the number of position pulses,

means responsive to said digital signal for applying control voltage to said motor,

means for providing a first signal when said motor is at rest,

means for providing a second signal when said digital signal representation is zero, and

means for preventing at least one of the least significant bits of said digital representation from reaching the means responsive to the digital representation for applying a control voltage to said motor when said first signal indicates the motor is essentially at rest and the second signal indicates that the digital signal represents a zero count.

## 4,214,194

## TIMING CIRCUITRY AND METHOD FOR A STEPPING MOTOR

Thomas Horning, San Fernando, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Filed Dec. 2, 1977, Ser. No. 856,649

Int. Cl.[2] H02K *37/00*

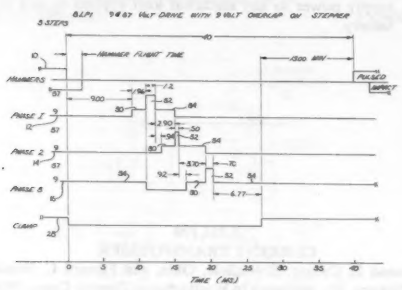
U.S. Cl. 318—696 11 Claims

1. An improvement in a method for driving and stopping a stepping motor capable of executing repetitive angular steps on a motor shaft and having a plurality of stator and rotor poles, said stator poles being grouped into a multiple of phased sets, said phased sets of stator poles being sequentialiy individually activated so that the rotor poles assume a plurality of equilibrium configurations wherein each stator pole of the activated one of said phased sets of stator poles is aligned with a rotor pole, said improvement comprising the steps of:

repetitively simultaneously activating, alternately with said sequential individual activation, at least two of said multiple of phased sets of stator poles to create a plurality of quasi-equilibrium configurations with respect to the relative position of said stator poles and rotor poles wherein none of the stator poles are aligned with a rotor pole and wherein each quasi-equilibrium configuration is position-

ally distinguishable from each of said plurality of equilibrium configurations, whereby said motor runs in a smooth and uniform manner; and

stopping said motor at a predetermined shaft position by initially activating said stator poles to step said shaft toward said predetermined shaft position, momentarily



activating at least two of said phased sets of stator poles to retard the rotation of the shaft by urging the shaft in a reverse direction toward a quasi-equilibrium configuration, and finally again activating said stator poles to complete the step to said predetermined position, whereby said motor will stop in a smooth, nonoscillatory manner.

---

**4,214,195**

## MOTOR CONTROL CIRCUITS

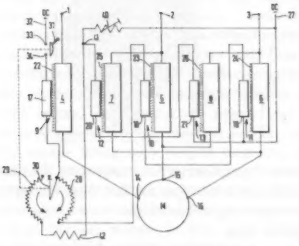
**Robert J. Logan, Sheffield, England, assignor to Inductive Controls Limited, Sheffield, England**

**Filed Mar. 20, 1978, Ser. No. 888,300**

**Claims priority, application United Kingdom, Mar. 22, 1977, 12132/77**

**Int. Cl.[2] H02P** *7/64*

**U.S. Cl. 318—745** **6 Claims**



1. A squirrel cage motor control circuit for controlling the direction of rotation of a motor having first, second and third stator windings to be fed from a three-phase supply, and having a squirrel cage rotor, said circuit comprising first, second and third saturable reactors having respective main windings to be connected, respectively, between first, second and third phases of the supply and said first, second and third stator windings; a fourth saturable reactor having a main winding to be connected between said second supply phase and said third stator winding; a fifth saturable reactor having a main winding to be connected between said third supply phase and said second stator winding; each said saturable reactor having respective excitation winding means, and each of said second and third saturable reactors having a magnetisation curve relating magnetising force and applied voltage which exhibits a knee point for zero current in the respective excitation winding means and for substantially the phase voltage applied across the main winding; the circuit further comprising means to supply direct current selectively to the excitation winding means to cause at least near saturation of the cores of said first, second and third reactors to run the motor in one direction in a high torque condition, whilst said fourth and fifth reactors are in an unexcited/high impedance state; and to limit excitation of said first, fourth and fifth reactors to only partial excitation for running the motor in the reverse direction in a lower torque condition, whilst said second and third reactors are in an unexcited state and a magnetising current flows therethrough greater than that required for operation at said knee point but not greater than the full load design current of said main windings of said second and third reactors.

---

**4,214,196**

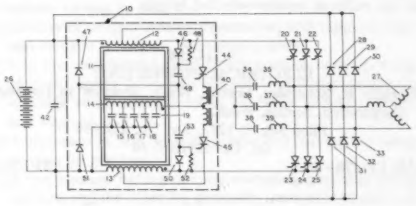
## ENERGY CONTROLLER FOR CONVERSION FROM A DIRECT CURRENT SOURCE TO A VARIABLE FREQUENCY LOAD

**Jay Boyce, Anaheim, Calif., assignor to Jay Boyce & Associates, Anaheim, Calif.**

**Filed Aug. 14, 1978, Ser. No. 933,656**

**Int. Cl.[2] H02P** *7/42, 7/64*

**U.S. Cl. 318—811** **12 Claims**



1. A turn-off circuit for a multiphase motor comprising a DC powered three element core transformer including:

i. a central core element having a winding thereon;

ii. outer core elements bearing loosely coupled positive and negative windings, thereby reducing rf transients, the central and outer windings being closely coupled, thereby enhancing pulse generation;

iii. a plurality of parallel connected capacitors coupled to the central winding to fire simultaneously and thereby provide uniform and suitably shaped trapezoidal turn off pulses; and,

iv. positively and negatively biased turn off SCRs to sequentially fire and admit the turn off pulses to the central winding for switching DC power from the motor.

---

**4,214,197**

## BATTERY CHARGER FOR A PORTABLE RADIO

**Friedrich H. Mann, and Paul F. Sensabaugh, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.**

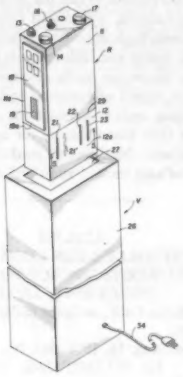
**Filed Dec. 26, 1978, Ser. No. 973,646**

**Int. Cl.[2] H01M** *10/46;* **H02J** *7/00;* **H01R** *13/54*

**U.S. Cl. 320—2** **14 Claims**

1. A battery charger for portable radios of variable lengths having a battery pack and a plurality of charging terminals on the outer surface of said battery pack comprising, in combination, a housing having a central recess for slidably accommodating a portable radio, stop means on said housing engagable with a radio inserted in said recess for positioning said portable radio at a fixed axial position within said recess, a plurality of sets of charging contacts arranged in axially spaced relationship on the inner wall of said central recess for circuit making engagement with said charging terminals on said battery pack, one of said sets of charging contacts being arranged for circuit making engagement with the charging terminals on the battery

pack of a portable radio of one selected length and another set of charging contacts being arranged for said circuit making



engagement with the charging terminals on the battery pack on the radio of another selected length.

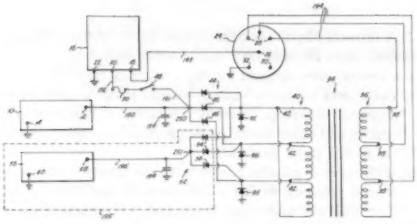
---

**4,214,198**

**ELECTRICAL POWER UNIT**

**Franklin R. Schneider, Seattle, Wash., assignor to Dynamote Corporation, Seattle, Wash.**

**Filed Sep. 1, 1977, Ser. No. 829,955**
**Int. Cl.[2] H02J *7/14***
**U.S. Cl. 320—15** **21 Claims**



1. An electrical power unit for increasing the DC power output of an electrical generating system on an engine driven vehicle, the said system being of the type including a first DC storage battery having a characteristic voltage; a dynamo driven by said vehicle engine and having a field winding terminal, a plurality of AC voltage output terminal means having a regulated and substantially constant amplitude AC output voltage thereon, and a DC output terminal isolated from said electrical generating system and which under normal use delivers low voltage DC power to said electrical generating system; and voltage regulator means having input means connected to said DC storage battery and a field output terminal connected to said field winding terminal of said dynamo controlling the field in said dynamo in response to variations in voltage at said DC output terminal; the said power unit comprising:

(a) step down transformer means connected to said plurality of AC voltage output terminal means for producing a first lower AC voltage; and

(b) means for rectifying said first lower AC voltage to produce a first DC voltage at a first rectifier output terminal having increased power capability in proportion to the turns ratio of said step down transformer means; wherein said input means on said voltage regulator means is connected to said first rectifier output terminal and said voltage regulator means is responsive to variations in said first DC voltage to maintain said first DC voltage at a relatively constant, desired and nonvariable level, and wherein said first rectifier output terminal is connected to said first battery to maintain the charge thereof and to supply power to any electrical load applied to said first battery.

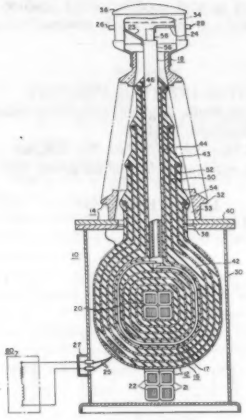
---

**4,214,199**

**CURRENT TRANSFORMER**

**Edmond E. Conner, Brookfield, Ohio, and Edward C. Wentz, Hickory, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 27, 1978, Ser. No. 881,475**
**Int. Cl.[2] G05F *3/00***
**U.S. Cl. 323—6** **6 Claims**



1. A current transformer for monitoring the current flowing in an electrical circuit of an electrical power transmission and distribution system, comprising:

a magnetic core;

first and second windings disposed in inductive relation with said magnetic core;

said first winding being adapted to be energized by the current flowing in the electrical circuit of the electrical power transmission and distribution system,

said second winding having a plurality of conductor turns,

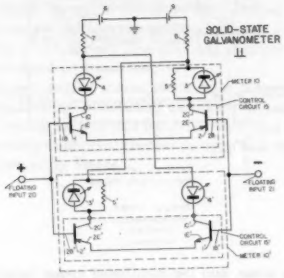
an inductance element including a winding having terminals, with the terminals being directly connected to said second winding to connect the winding of said inductance element across at least certain of the conductor turns of said second winding,

said inductance element having a substantially linear voltage versus excitation current characteristic, and an inductance which is less than the inductance of said second winding, to increase the total excitation current required to magnetize said magnetic core and reduce the residual flux in said magnetic core when the magnetic field intensity is reduced to zero.

## 4,214,200
## LIGHT-EMISSIVE ELECTRICAL MEASUREMENT APPARATUS WITH FLOATING INPUTS

James F. Hollander, 3000 Douglas Ave., No. 13, Des Moines, Iowa 50310

Filed Nov. 1, 1978, Ser. No. 956,669
Int. Cl.[2] G01R 19/00, 19/16
U.S. Cl. 324—122 5 Claims




1. Electrical measurement apparatus comprising

a plurality of means for emitting light in response to a first electrical current, each said light-emitting means having a different turn-on threshold to said first current, each said light-emitting means having two terminals for entry and exit respectively of said first current;

meter scale means for displaying a plurality of magnitudes of a same sign to be measured, said light-emitting means being physically arranged relative to said meter scale means in order of increasing current threshold so as to correspond to said magnitudes of said meter scale means;

means for providing an electrical current to be measured;

means for supplying said first electrical current for said light-emitting means; and

means for controlling said first current in response to said measurement current comprising first and second semiconductively-complementary active semiconductor means each having first and second output-control conductors and an input-sensing conductor, said first output-control conductor of said first semiconductor means being electrically connected to said first output-control conductor of said second semiconductor means, said second output-control conductors of said first and second semiconductor means being two output terminals for said control means, said input-sensing conductor of said first semiconductor means and said input-sensing conductor of said second semiconductor means being connected to said measurement current means so that said measurement current passes into one of said input-sensing conductors, thence to the first output-control conductor of the semiconductor means having said one said input-sensing conductor and to the first output-control conductor of the other semiconductor means and thence from the other said input-sensing conductor of said other semiconductor means to said measurement current providing means;

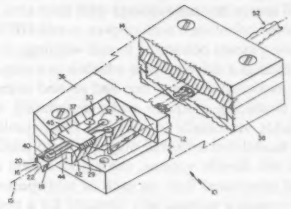
said light-emitting means terminals, said first current supply means and said first current control means output terminals being electrically connected in a single series configuration including said light-emitting means and said control means;

said plurality of light-emitting means being successively turned on with increasing measurement current magnitude, all said plurality of light-emitting means emitting light when said measurement current is present in an amount corresponding to the largest magnitude to be measured on said meter scale means.

## 4,214,201
## INTEGRATED CIRCUIT TESTING PROBE

Walter P. Kern, Cohasset, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 24, 1978, Ser. No. 880,788
Int. Cl.[2] G01R 1/06
U.S. Cl. 324—158 P 23 Claims



1. In a probe for electrically contacting the lead of an IC with a plurality of contact tip portions spaced apart sufficiently to permit measurement of electrical activity in a lead element therebetween, that improvement comprising

a support having an axis, and

a plurality of contact elements carried by said support, each said element having an operating position,

at least one said element having a rest position with a portion of itself spaced from said support and being resiliently movable about said axis to an operating position against said support,

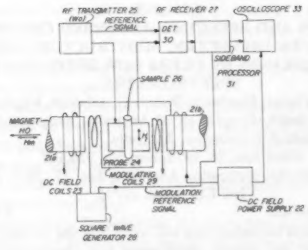
said elements in said operating positions having coplanar contact tip portions,

said one element having one leg extending generally along said axis and the other leg generally transverse to said axis and having said tip portion thereon, whereby said one leg acts as a torsion spring when said tip portion is moved between its rest and operating positions.

## 4,214,202
## SLOW SQUARE WAVE MODULATED GYROMAGNETIC RESONANCE SPECTROMETER FOR AUTOMATIC ANALYSIS AND PROCESS CONTROL

Maurizio Bonori, Rome, Italy, assignor to Cafiero Franconi, Rome, Italy, a part interest

Filed Apr. 20, 1978, Ser. No. 898,296
Int. Cl.[2] G01R 33/08
U.S. Cl. 324—313 15 Claims




1. A gyromagnetic resonance spectrometer for analyzing a sample containing gyromagnetic species, comprising: means for generating a vectorial uniform DC polarizing magnetic field of an intensity $H_o$ which is sufficient to cause said gyromagnetic species to resonate; a probe for supporting the sample within said DC field and including a magnetic assembly with a magnetic structure having associated input and output circuit

means, coupled to RF transmitting means and RF receiving means, respectively, and said sample being located adjacent to said magnetic assembly, said transmitting means generating a signal at a frequency $\omega_o$ for exciting said sample through said magnetic assembly, with an RF magnetic field orthogonal to said DC field and of a power level set by said RF transmitter means, thereby generating a resonance signal which is coupled to said receiving means; magnetic field modulating means including coil means having windings with their axes dipsosed in predetermined orientation with respect to said DC field, and signal generating means connected to said windings for supplying to said windings a drive current which is at a frequency $\omega_o$ and which is switched between first and second intensity values thereby producing a square wave modulating magentic field which adds vectorially to said DC field, resulting in a square wave modulated vectorial magnetic field which is distributed over the sample volume, the extreme field intensity values of said modulated field on each of said species within said sample remaining substantially constant for a time corresponding to approximately the length of each half-period of said modulation frequency, one of said extreme intensity values of the field intensity corresponding to the peak value and the other to the valley value of said modulated field, said modulated field providing square wave periodical modulation of the intensity of the resonance curve of each gyromagnetic species within said sample, said frequency $\omega_m$ being substantially less than both the said frequency $\omega_o$ and the width of the resonance curve of said sample, said modulation of the resonance intensity reulsting in a switching of said resonance intensity between first and second different levels corresponding to the extreme distributions of said modulated field on said species with said sample, whereby the resultant resonance signal is constituted by a frequency modulation spectrum centered around $\omega_o$ and having sideband components separated by frequency $\omega_m$, and having amplitudes proportional to the difference between said first and second resonance intensity levels; said receiving means comprising detecting means for detecting one or more signal components of said modulation spectrum of said resultant resonance signal, and signal processing means for processing the detecting signal components and providing an output indicative of the difference between said first and second resonance intensity levels.

---

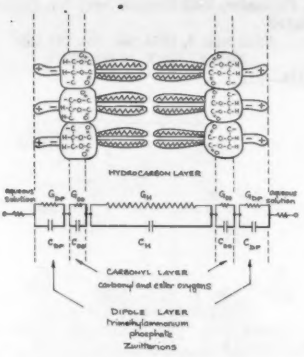
**4,214,203**

## LOCATION AND EFFECT OF ADSORBED CHEMICALS ON THE DIELECTRIC SUBSTRUCTURE OF MEMBRANES BY ULTRA LOW FREQUENCY SPECTROMETRY

**Hans G. L. Coster, Randwick; Robert G. Ashcroft, Valcluse, and John R. Smith, Coogee, all of Australia, assignors to Unisearch Limited, Kensington, Australia**

**Filed Jun. 16, 1978, Ser. No. 916,147**
**Claims priority, application Australia, Jun. 17, 1977, PD475**
**Int. Cl.² G01N *27/42***
**U.S. Cl. 324—425** **5 Claims**

1. Apparatus for measuring and recording the variation with frequency of the overall capacitance and conductance of a membrane, such as a bimolecular lipid or protein membrane, comprising: means for supporting such a membrane in an electrolyte, first electrodes in said electrolyte for passing an alternating current through the membrane, means for generating an alternating voltage at any desired frequency of a plurality of frequencies within a range of from 0.001 Hz to about 1000 Hz and applying same to said electrodes, means for measuring the overall conductance and capacitance of the membrane at each of a plurality of frequencies in said range and for




recording the same, said last-mentioned means including second electrodes separate from said first electrodes.

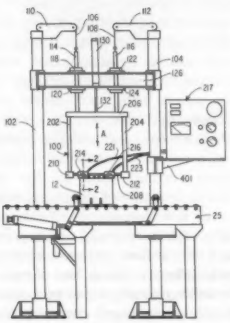
---

**4,214,204**

## HIGH RATE, BATTERY TESTING APPARATUS AND METHOD

**William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.**

**Continuation-in-part of Ser. No. 887,063, Mar. 16, 1978, Ser. No. 770,889, Feb. 22, 1977, and Ser. No. 697,786, Jun. 21, 1976, which is a continuation of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sep. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sep. 28, 1971, abandoned, said Ser. No. 770,889, is a continuation of Ser. No. 600,840, Jul. 31, 1975, Pat. No. 4,027,797, which is a division of Ser. No. 475,273, May 31, 1974, Pat. No. 3,938,368. This application Apr. 11, 1978, Ser. No. 895,520**
**Int. Cl.² G01N *27/46***
**U.S. Cl. 324—437** **8 Claims**



1. An apparatus for "high-rate" testing storage batteries of the type having a case and at least one terminal extending therethrough, said apparatus comprising:

(a) A work surface for supporting batteries to be tested;

(b) a frame associated with said work surface;

(c) a battery processing head mounted on said frame for reciprocal movement with respect to said frame between at least standby and battery testing positions;

(d) battery terminal connecting means mounted on said head for establishing electrical contact with said battery termi-

nals upon movement of said head to said battery testing position, said battery terminal connecting means comprising at least one battery terminal connecting block mounted on said battery processing head for slideable movement with respect to said head along an axis transverse to the axis of reciprocation of said head, said battery terminal connecting block adapted to mateably receive at least one battery terminal post insert, said battery terminal post insert having a lower surface defined thereon to create an air tight seal between said insert and at least a portion of the battery case disposed adjacent to said battery terminal post; and

(e) high rate testing means electrically connected to said battery terminal connecting means for selectively "high-rate" testing each of said batteries when said batteries are electrically connected thereto through said battery terminal connecting means.

---

**4,214,205**

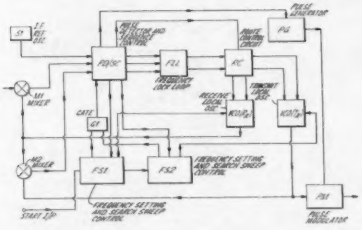
## RADIO RECEIVING AND RETRANSMITTING APPARATUS WITH FREQUENCY LOCK CIRCUIT

**Ashley W. Guest, Bristol, England, assignor to British Aircraft Corporation, London, England**

**Continuation-in-part of Ser. No. 731,357, Oct. 12, 1976, abandoned. This application Jul. 5, 1978, Ser. No. 922,218**

**Int. Cl.² H04B 7/155**

**U.S. Cl. 455—20** **7 Claims**



1. A method of detecting an incoming RF signal and transmitting a corresponding regenerated signal at a predetermined frequency, comprising:

sweeping a first local oscillator signal through a range of frequencies and mixing the first local oscillator signal with an incoming RF signal;

detecting the presence, in the mixed signals, of a first IF signal within a predetermined frequency range and thereupon stopping the sweep;

enabling closed-loop frequency locking means which adjusts the frequency of the first local oscillator until the frequency of the first IF signal is equal to a first reference frequency;

thereafter sweeping a second local oscillator signal through a range of frequencies and mixing the second local oscillator signal with the output of the first local oscillator;

detecting the presence, in the mixed local oscillator signals, of a second IF signal within a predetermined frequency range and thereupon stopping the sweep;

enabling closed-loop frequency locking means to cause it to adjust the frequency of the second local oscillator until the frequency of the second IF signal is equal to a second reference frequency; and thereupon transmitting the signal at the frequency of the output of the second local oscillator.

**4,214,206**

## DIGITAL TRANSMISSION SYSTEM HAVING DIRECT BIT EXTRACTION FROM SCRAMBLED BIT STREAMS

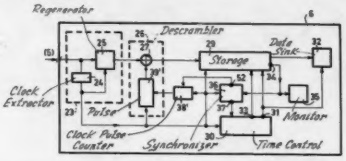
**Klaas Everaarts, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 18, 1978, Ser. No. 934,824**

**Claims priority, application Netherlands, Sep. 27, 1977, 7710503**

**Int. Cl.² H04B 7/155**

**U.S. Cl. 375—4** **3 Claims**




1. An improved digital transmission system with direct bit extraction from a scrambled bit stream, said transmission system having a plurality of regenerative repeaters constituting a digital link between a transmitter terminal station and a receiver terminal station, each terminal station having associated digital peripheral equipment, the transmitter peripheral equipment including means for dividing the bit stream to be transmitted into consecutive transmission frames having a fixed number of bit positions and for inserting at least one extra bit in a given bit position of each of the consecutive transmission frames, said transmitter peripheral equipment furthermore including a scrambler in which said bit stream divided into consecutive transmission frames having a fixed number of bit positions and at least one extra bit added in a given bit position of each consecutive transmission frame is combined modulo-2 with a scramble pulse pattern for generating a scrambled bit stream for transmission by said digital link and reception by said receiver, said receiver peripheral equipment including a descrambler for descrambling the transmitted scrambled bit stream received from the digital link, said receiver peripheral equipment furthermore including means for selecting extra bits inserted into the consecutive transmission frames, wherein the improvement comprises:

a transmission clock pulse counter in said transmitter and in said receiver peripheral equipment for counting clock pulses in said means for dividing said bit stream, said counters having a final counting position in a given fixed relation to the number of bit positions per transmission frame;

said clock pulse counters supplying a setting pulse in their final counting position;

a pulse pattern generator in said scrambler and descrambler adjusted to an initial generation state by a setting pulse from said clock pulse counter for generating a given fixed scramble pulse pattern;

said regenerative repeaters and said receiver peripheral equipment including:

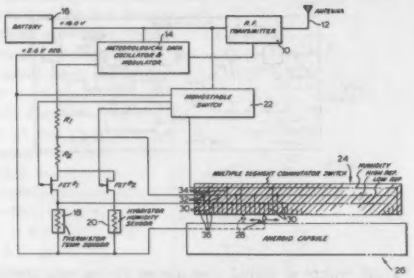
selection means for selecting the extra bits inserted in said consecutive transmission frames on the basis of said fixed relation between the final counting position of said clock pulse counters and the number of bit positions per transmission frame;

said selection means in said receiver peripheral equipment also supplying synchronizing pulses for synchronizing the transmission clock pulse counter in the receiver peripheral equipment with that in the transmitter peripheral equipment.

## 4,214,207
## SWITCHING CIRCUIT FOR RADIOSONDE

Vernon E. Dickson; James G. C. Lee, both of Toronto, and Gurbachan S. Saini, Markham, all of Canada, assignors to Sangamo Company Limited, Canada

Continuation of Ser. No. 778,815, Mar. 17, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,449
Claims priority, application Canada, Sep. 10, 1976, 260967
Int. Cl.[2] H04B 1/034
U.S. Cl. 455—95 19 Claims




10. A radiosonde comprising:

a transmitter and means for modulating said transmitter;

a multiple segment switch element having a plurality of contacts including a series of interconnected contacts;

a wiper movable along said multiple segment switch element and electrically connecting to differing ones of said contacts during wiper movement;

a pressure sensitive device operatively engaging said wiper and moving said wiper along said multiple segment switch element in response to pressure changes;

an atmospheric information sensing element;

a fixed resistance coupled to said modulating means; and

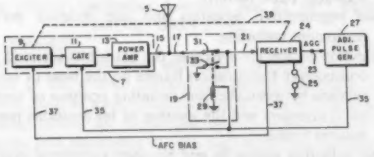
a switching device coupling said modulating means to said atmospheric information sensing element via said fixed resistance;

said series of contacts being coupled to said modulating means via a portion of said fixed resistance and bypassing said information sensing element and said switching device so that when said wiper connects electrically to any contact of said series, reference signals are transmitted by said sonde and atmospheric information signals are transmitted at certain other positions of said wiper along said multiple segment switch element.

## 4,214,208
## JAMMING OF KEYED CONTINUOUS WAVE RADIO SIGNALS

Richard V. O'Donnell, Freehold, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1963, Ser. No. 300,708
Int. Cl.[2] H04K 3/00
U.S. Cl. 455—1 1 Claim

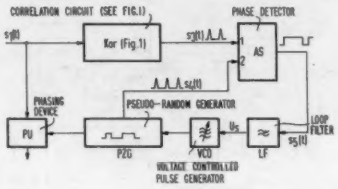



1. A jamming station for radiotelegraph signals comprising, a transmitter, said transmitter comprising an exciter, the output of said exciter being connected to the input of a power amplifier via a normally closed gate, the output of said power amplifier being connected to a duplex antenna; a receiver the input of said receiver being connected to said duplex antenna via a transmit-receive switch which is normally in the receive position, means to gang tune said receiver and transmitter to a radiotelegraph signal to be jammed, an automatic frequency control bias connected from said receiver to said exciter, an adjustable pulse generator having its input connected to the automatic gain control line of said receiver and arranged to generate a pulse at the end of each pulse of radio frequency in said radiotelegraph signal, the pulse output of said pulse generator being arranged to open said gate and to energize said transmit-receive switch, thereby causing said jammer to emit a pulse or radio frequency energy and to simultaneously disable said receiver, the duration of the pulse output of said pulse generator being adjusted to substantially fill in the gaps or spaces in said radiotelegraph signal, and means to monitor the output of said receiver.

## 4,214,209
## CIRCUIT FOR SYNCHRONIZING A PSEUDO-RANDOM GENERATOR MOUNTED AT A RECEIVER FOR COMMUNICATION TRANSMISSION SYSTEMS UTILIZING PSEUDO-NOISE PHASE SHIFT KEYING

Walter P. Baier, Kaiserslautern, and Harald Grammueller, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 942,125
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742696
Int. Cl.[2] H04K 1/04; H04L 7/00, 27/10
U.S. Cl. 375—1 8 Claims




1. A circuit for interference suppressing communication transmission systems having narrow-band, conventional message modulation and additional pseudo-random phase shift keying (PN-PSK), and which serves to synchronize a pseudo-random generator which is located at the receiver and which actuates a phase shifting device at the receiver which cancels phase shift keying accomplished at the transmitter by using a regulating loop with a delay device such as a delay line for correlating the received signal with the pseudo-random sequence which is produced at the receiver, and in conformity with the transmitted pseudo-random sequence, consists of an apparently random line-up of the binary values L and H in a fixed pulse plan, where the sequence repeats after a specific number of timing pulses, characterized in that said delay device (VL) which is fed with the received signal ($s_1(t)$) possesses k output tappings with the time spacing ($T_c$) between them which corresponds to the inverse value of the pulse train frequency of the pseudo-random sequence, and a first portion ($k_H$) of the tappings is connected directly to an adder (S) and a second portion ($k_L$) of the tappings is connected to a 180° phase shifting element (Ph) which has its output connected to said adder (S), and the program selection of the tappings for the two portions is such that the one portion corresponds to the L-values and the other portion to the H-values of the binary pseudo-random sequence or a portion thereof, and a rectifier receiving the output signal of the adder (S), a phase detector (AS) receiving the output ($s_3(t)$) of said rectifier (GR) which has the form of a pulse and said phase detector (AS) also

receiving a signal ($s_4(t)$) which is periodically derived from the pseudo-random generator (PZG) mounted at the receiver, during each pseudo-random sequence produced by said generator (PZG) and which is in a suitable pulse form, said phase detector (AS) producing an output voltage ($s_5(t)$) which is a regulating voltage dependent upon the mutual phase state of the two input signals and which is used to regulate the pulse train frequency of the pseudo-random generator (PZG) mounted at the receiver.

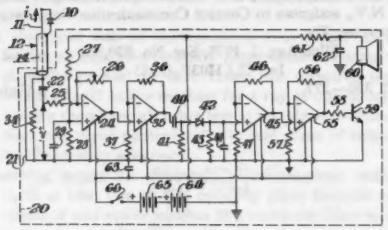
---

**4,214,210**

**ELECTROMAGNETIC NOISE SOURCE LOCATOR**

**Martin W. O'Shea, Manchaug, Mass., assignor to Sprague Electric Company, North Adams, Mass.**

**Filed Jan. 9, 1978, Ser. No. 868,020**
**Int. Cl.² H04B 1/18, 17/00**
**U.S. Cl. 455—282** **6 Claims**



1. An apparatus for locating the source of sparking electromagnetic noise radiation comprising:
   (a) an indicator means for producing an indication of the presence of an electrical signal;
   (b) an audio amplifier, an output thereof being electrically connected to said indicator means; and
   (c) an r.f. antenna-detector means comprising a conductive loop, a diode, a capacitor and a coaxial cable that has a center conductor and a cylindrical outer conductor, said loop having an area of less than 1 square inch and being connected between said conductors at one end of said cable with said diode forming a part of said loop; said loop, said diode, said capacitor and said cable conductors forming a series circuit which is connected across the input of said audio amplifier.

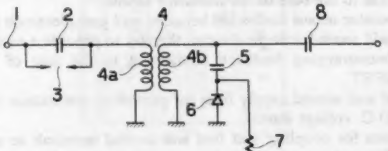
---

**4,214,211**

**ELECTROSTATIC DESTRUCTION PREVENTING CIRCUIT FOR USE IN A RECEIVER**

**Tomohisa Yokogawa, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jun. 19, 1978, Ser. No. 917,041**
**Claims priority, application Japan, Jun. 22, 1977, 52-74247**
**Int. Cl.² H04B 1/10**
**U.S. Cl. 455—287** **3 Claims**



1. In an electrostatic destruction preventing circuit for use in a receiver for receiving radio waves of AM and FM broadcastings of the type including an antenna input circuit and a spark-gap discharge element to an antenna terminal to prevent the electrostatic destruction of a first stage transistor in the receiver, the improvement characterized by a capacitor connected in series between the antenna terminal and said antenna input circuit and a spark-gap discharge element connected in parallel to said capacitor, whereby the electrostatic destruction of a first transistor of the receiver is prevented.

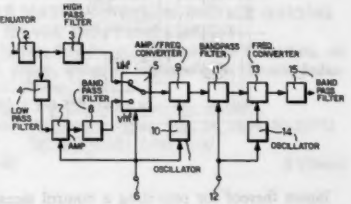
---

**4,214,212**

**TUNER DEVICE FOR A TELEVISION RECEIVER**

**Edoardo Dipietromaria, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta, Italy**

**Continuation-in-part of Ser. No. 768,672, Feb. 14, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,445**
**Claims priority, application Italy,**
**Int. Cl.² H04B 1/26**
**U.S. Cl. 455—190** **5 Claims**




1. A signal tuning device for a television receiver, including an intermediate frequency amplifier for receiving, selecting, amplifying ad converting to the intermediate frequency of the television receiver signals belonging to both the VHF and UHF ranges; said device including a first section for receiving and amplifying signals belonging to the UHF range and converting them to said intermediate frequency; said first section including first circuit means for amplifying UHF signals and converting signals belonging to the VHF range into signals belonging to the UHF range, and second circuit means for supplying a first local signal and mixing said first local signal with the amplified UHF signals from said first circuit means so as to convert them to said intermediate frequency for application to said IF amplifier; said first section including a plurality of circuit elements being formed by means of the deposition of conductive or resistive material onto a support made of insulating material; said plurality of circuit elements including resonant lines, conductive circuit elements, resistive circuit elements, inductive circuit elements and capacitive circuit elements; said device further including a second section for receiving and amplifying signals belonging to the VHF range and for generating a second local signal and supplying said amplified VHF signals and said second local signal to said first circuit means of said first section; said first circuit means mixing said second local signal and said amplified VHF signals to convert them into signals to the UHF range.

---

**4,214,213**

**SIGNAL SELECTING SYSTEM**

**Ronald G. Ferrie, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Oct. 25, 1977, Ser. No. 845,213**
**Int. Cl.² H03K 5/18, 5/20**
**U.S. Cl. 328—117** **1 Claim**

1. A signal selecting system responsive to signals from a plurality of signal sources for rapidly comparing and selecting the best quality signal, comprising:
   a plurality of detectors with a detector coupled to and responsive to each one of said sources for continuously detecting the quality of said signals from said sources for

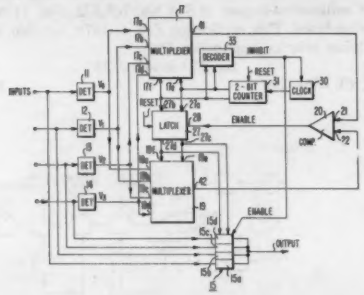
thereby continuously and simultaneously providing from each detector detected signals indicative of the quality of the signal present at the source,

a comparator,

means coupled to said plurality of detectors for sequentially coupling said detected signals from said plurality of sources to a first input of said comparator,

reference means coupled to said plurality of detectors for coupling the detected signals from a selected one of said sources to a second input of said comparator,

said comparator being responsive to the simultaneously and continuously detected signals at said first and second




inputs thereof for providing a control signal when the signal at said first input indicates a better quality signal than at said second input,

said reference means including means coupled to said first means and responsive to said control signal for providing a signal indicative of the source of the detected signal coupled to the first input of the comparator and for gating the detected signal corresponding to said indicative signal to the second input of said comparator, and

means responsive to said indicative signal and coupled to said plurality of sources for gating that source corresponding to said indicative signal out of the system.

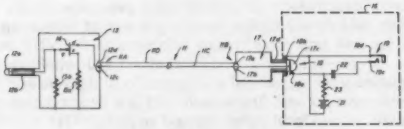
---

**4,214,214**

## CONNECTING CABLE

**George W. Merriman, 90 Pierrepont St., Brooklyn, N.Y. 11201**

**Filed Aug. 3, 1978, Ser. No. 930,644**
**Int. Cl.² H03F *3/16***
**U.S. Cl. 330—65** **11 Claims**



1. A connecting cable for connecting an electric pickup of a musical instrument with output terminals to a load, said connecting cable comprising:

(a) a coaxial cable having a central conductor and a further conductor;

(b) an input connector comprising a conventional male phone plug having first and second input terminals adapted to be connected to the output terminals of said pickup, and first and second output terminals connected to the central and further conductors of said coaxial cable respectively;

(c) a single transistor, in the form of a field effect transistor having a source, a drain and a gate terminal, said gate terminal connected to said first input terminal and said drain terminal connected to said first output terminal, disposed within said conventional male phone plug; and

(d) an output connector connected to the other end of said coaxial cable.

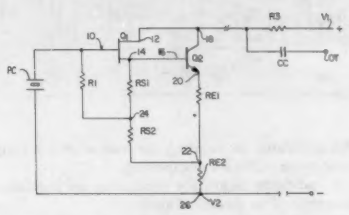
---

**4,214,215**

## LOW NOISE-HIGH GAIN JFET AMPLIFIER FOR A PIEZOELECTRIC TRANSDUCER

**Arthur J. Mellen, Clearwater, Fla., and Adolf Reitlinger, Kingston, N.Y., assignors to Contact Communication Corporation, Clearwater, Fla.**

**Filed Aug. 2, 1978, Ser. No. 930,364**
**Int. Cl.² H03F *3/185***
**U.S. Cl. 330—277** **6 Claims**




1. A two wire sensing transducer and amplifier combination, comprising

a piezoelectric transducer having first and second electrical leads,

a junction field effect transistor (JFET) having drain, source, and gate electrodes,

a first transistor having collector, emitter, and base electrodes,

means for connecting one lead of the transducer to the gate electrode of said JFET,

means for connecting said source and base electrodes together,

first and second terminals connected, respectively, to said drain and collector electrodes and to the second lead of the transducer,

a first voltage divider connected between said emitter electrode and said second terminal,

a second voltage divider connected between said connected source and base electrodes and said first voltage divider, thereby to provide a first bootstrapping feedback connection to the base of the transistor means,

a resistor means connected between said gate electrode and said second voltage divider, thereby to provide a second bootstrapping feedback connection to the gate of the JFET,

first and second supply lines for providing connection to a D.C. voltage source,

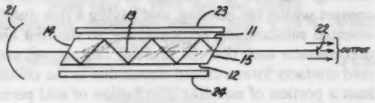
means for coupling said first and second terminals to said first and second supply lines, respectively, and

output circuit means connected between said supply lines and separate from said transistor means and from said first and second terminals for coupling from said supply lines an output signal produced by said combination of transducer and amplifier.

## 4,214,216
## FACE-PUMPED LASER WITH DIFFRACTION-LIMITED OUTPUT BEAM

William B. Jones, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 851,445, Nov. 14, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,567
Int. Cl.[2] H01S 3/08
U.S. Cl. 331—94.5 C 14 Claims




1. A multiple reflection face-pumped laser for emitting a diffraction-limited output beam in a longitudinal direction, comprising:

an elongated slab of homogeneous active laser medium having at least two optically plane faces extending substantially parallel to each other, the effective optical length of said active medium for a ray of optical energy passing therethrough being less in the plane of reflection than in a plane perpendicular to said plane of reflection and containing said ray;

pumping means for impinging electromagnetic radiation upon at least one of said optically plane faces to excite atoms of said active medium to a metastable state so as to produce a population inversion therein;

optically plane reflective means spaced from said active medium at one end thereof; and

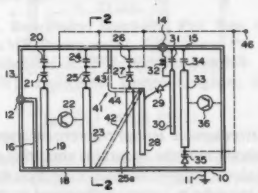
concave spherical reflective means spaced from said active medium at the opposite end thereof,

said plane reflective means and said spherical reflective means defining opposite ends of a cavity resonant to optical energy passing through said active medium in a general direction parallel to said two optically plane faces of said active medium and normal to the surface of said spherical reflective means at the point of impingement thereon, such that said cavity is stable in said plane of reflection but unstable in said plane perpendicular to the plane of reflection.

## 4,214,217
## ELECTRONIC TUNING CIRCUIT HAVING IMAGE TRAPPING ELEMENT

Mitsuo Saito, and Sadahiko Yamashita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 14, 1979, Ser. No. 12,216
Claims priority, application Japan, Feb. 15, 1978, 53-17275
Int. Cl.[2] H03J 3/00, 5/00
U.S. Cl. 334—45 8 Claims




1. A tuning device comprising:

a first resonant circuit including a transmission line and a coupling circuit reactively coupled therewith;

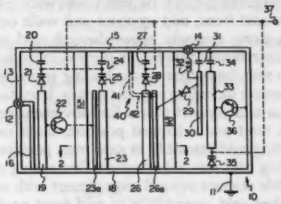
a second resonant circuit including a transmission line and a coupling circuit reactively coupled therewith, the transmission lines of said first and second resonant circuits being parallel to each other; and

an image frequency trapping circuit having a first section extending from a point intermediate said transmission lines to a point connected to the coupling circuit of said first resonant circuit intersecting the transmission line of said first resonant circuit, and a second section extending at an angle to said transmission lines from the connection point of said first section with said coupling circuit to a point adjacent to the transmission line of said second resonant circuit.

## 4,214,218
## IMPEDANCE MATCHED TUNING DEVICE HAVING IMAGE TRAPPING CIRCUIT

Mitsuo Saito; Mitsuo Makimoto, and Sadahiko Yamashita, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1979, Ser. No. 15,601
Claims priority, application Japan, Feb. 28, 1978, 53-22973
Int. Cl.[2] H03J 3/00, 5/00
U.S. Cl. 334—45 3 Claims




3. A bandpass filter comprising:

a conductive housing;

a dielectric substrate supported in said housing;

a pair of first and second resonant circuits each including an elongated conductor to serve as a transmission line and a capacitive element connected to the transmission line in series between a pair of oppositely facing walls of said housing, the transmission lines of said resonant circuits being disposed on said substrate and arranged in parallel to each other;

an image frequency trapping circuit arranged to intersect the transmission line of one of said first and second resonant circuits for absorbing the microwave energy at the image frequency of the bandpass filter;

a first elongated conductor disposed on said substrate extending across said oppositely facing walls in parallel with, and adjacent to, the transmission line of said first resonant circuit; and

a second elongated conductor disposed on said substrate extending across said oppositely facing walls in parallel with, and adjacent to, the transmission line of said second resonant circuit remote from the transmission line of said first resonant circuit, said first and second conductors being spaced respective distances from the adjacent transmission lines to compensate for the difference between the characteristic impedances of said transmission lines resulting from the intersection of said image frequency trapping circuit with the transmission line of said one resonant circuit.

**4,214,219**

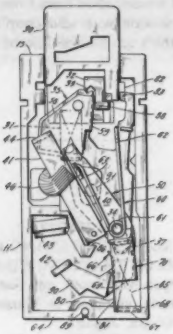
## PUSH-PUSH SWITCH

**Bernard DiMarco, and John C. Hempstead, both of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.**

**Filed Apr. 28, 1978, Ser. No. 901,081**

**Int. Cl.[2] H01H *73/48, 75/00, 77/00***

**U.S. Cl. 335—23** **12 Claims**



**1.** A switch including relatively movable and stationary contacts; a mechanism for operating said movable contact into and out of engagement with said stationary contact; a housing wherein said contacts and said mechanism are disposed; said housing including a front, opposed side walls extending rearward from said front, and opposed end walls connecting said side walls along opposite edges thereof; said mechanism including a rearwardly depressible portion extending through an opening in said front; first means biasing said portion forward; said mechanism including support means, a contactor assembly mounted on said support means for movement relative thereto between a reset and a tripped position, latch means for normally holding said assembly in said reset position, said assembly including said movable contact, first spring means biasing said movable contact toward engagement with said stationary contact when said assembly is in said reset position, another spring means biasing said assembly toward said tripped position to separate said movable contact from said stationary contact when said latch means releases said assembly; release means operable to release said latch by depressing said portion when said assembly is in said reset position; and automatic trip means operable to release said latch upon the occurrence of predetermined fault conditions.

---

**4,214,220**

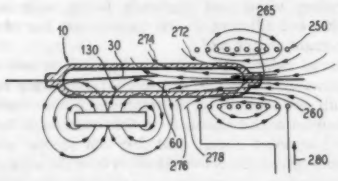
## WIDE RANGE MAGNETICALLY BIASED REED SWITCH

**Daniel L. Queen, Chicago, Ill., assignor to Chamberlain Manufacturing Corp., Elmhurst, Ill.**

**Filed Sep. 5, 1978, Ser. No. 939,486**

**Int. Cl.[2] H01H *51/27***

**U.S. Cl. 335—153** **6 Claims**




**1.** An improved, normally closed, reed relay having a hollow non-magnetic housing with a first and a second closed end; a first and a second magnetic reed contact supported by the housing, with the first contact having a section extending through the first closed end and into the housing and the second contact having a section extending through the second closed end and into the housing and with an end portion of each of the sections positioned adjacent to one another within the housing to form an open circuit between the contacts;

the improvement comprising:

a permanent magnet, adjacent the outside surface of the housing, centered with respect to the section of the first contact within the housing, and having a flux distribution oriented substantially perpendicular to the first and second contacts such that the first and said second magnetic reed contacts form a closed circuit due to the effects of at least a portion of said flux distribution of said permanent magnet; and,

an electrical coil adapted to receive the second end of the housing and substantially centered axially with respect to the second closed end of the housing where the section of the second contact enters the housing; said coil being operative to produce, in response to a first electrical current, a magnetic flux primarily near the second end of the housing, parallel to the second contact, of a selected magnitude, operative to offset at least a portion of said flux distribution of said permanent magnet resulting in said first and said second magnetic reed contacts forming an open circuit for the duration of said first electrical current in said electrical coil

the location of said permanent magnet and of said coil with respect to the second end and the magnetic flux distribution associated with said coil requiring a second current, at least ten times greater than said first current, to reclose the contacts.

---

**4,214,221**

## CONVERGENCE ASSEMBLY FOR CATHODE RAY TUBE

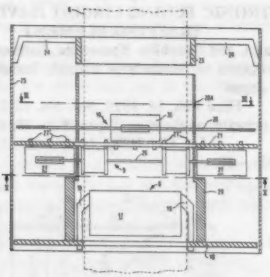
**Brian R. Sowter, and William A. Warwick, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 4, 1978, Ser. No. 966,440**

**Claims priority, application United Kingdom, Dec. 9, 1977, 51439/77**

**Int. Cl.[2] H01F *7/06*; H01J *29/66***

**U.S. Cl. 335—212** **10 Claims**



**1.** An electromagnetic lateral convergence assembly for use in a color cathode ray tube apparatus comprising an electrically-insulating planar support adapted to be mounted on the neck of a cathode ray tube in a plane orthogonal to the neck, a first planar magnetic core of high permeability magnetic material having a generally central aperture and having integral pole pieces extending toward the center of the aperture, at least three electrical coil assemblies mounted on selected pole pieces for producing, when energized, a magnetic field within the aperture, and means securing the magnetic coil assemblies to

said insulating support to hold said magnetic core in spaced parallel relationship with said support.

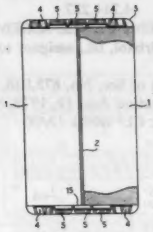
---

**4,214,222**

## IMPROVED CLAMPING MEMBERS IN A HORIZONTAL MAGNETIC CORE POWER TRANSFORMER

**Jean P. Lafaye, Oullins, France, assignor to Jeumont-Schneider, Puteaux, France**

**Filed Mar. 6, 1979, Ser. No. 18,096**
**Claims priority, application France, Mar. 9, 1978, 78 06738**
**Int. Cl.² H01F *27/26***
**U.S. Cl. 336—84 M** **2 Claims**



1. An improved power transformer having a horizontal magnetic core with a rectangular cross-section, end clamping members on opposite sides of said core with ends bearing on walls of a transformer tank, each clamping member having a number of longitudinal beams (5) intermediate and juxtaposed with two longitudinal side beams (4), said two side beams (4) each comprising of a set of magnetic laminations (6, 7) of the same width and welded at their edge to a number of cross-plates (11); said intermediate beams (5) being between said two side beams (4) and each comprising a set of laminations (6,7) of the same width and welded at their edge to a number of cross plates (11), the laminations of the intermediate beams being narrower than the laminations of the said side beams and each having a longitudinal extending flat iron member (15) welded at its edges along the ends of the cross-plates (11), the two side beams (4) and the intermediate beams (5) being of the same height and being so disposed that their magnetic laminations are positioned on edge, each set of magnetic laminations (6, 7) having at its centre a longitudinally extending wedge-shaped member (8) and being strengthened on each side by another longitudinally extending flat iron member (9, 10) of the same width.

---

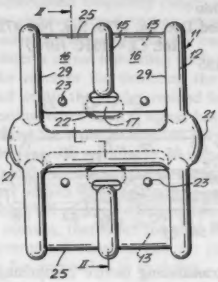
**4,214,223**

## FUSE

**Friedrich J. A. Kourimsky, Bensheim, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jul. 6, 1978, Ser. No. 922,264**
**Claims priority, application United Kingdom, Jul. 7, 1977, 28454/77**
**Int. Cl.² H01H *85/04***
**U.S. Cl. 337—293** **9 Claims**

1. A fuse comprising a thin metal strip of constant thickness having a slot extending to locations adjacent a pair of opposite ends of the strip to define relatively wide, spaced apart, side portions connected by relatively narrow fusible links at the ends, the strip being reversely folded along a line transverse to the slot and attached to oppositely directed faces of an insulating support one end of which is received within the fold so that the side portions of the strip adjacent the fold line define tab contacts for mating within receptacle contacts on a fuse board the supports having a recess or aperture underlying each fusible link so that the fusible links are spaced from surfaces of the support.



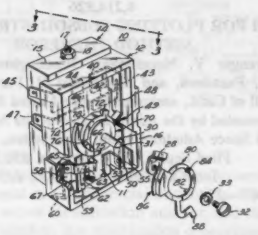
---

**4,214,224**

## MULTI-FUNCTION SELF-CLEANING OVEN THERMOSTAT

**Calvin J. Holtkamp, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio**

**Filed Sep. 25, 1978, Ser. No. 945,399**
**Int. Cl.² H01H *37/36***
**U.S. Cl. 337—323** **11 Claims**



1. A thermostat suitable for the control of a pyrolytic, self-cleaning oven comprising:

a housing;

an axially movable shaft mounted on the housing and rotatable for angular displacement between two end positions, an increment of shaft axial movement being in response to and directly related to an increment of shaft rotational movement;

an electrical switch means having a switching point adjustable in response to axial movement of the shaft;

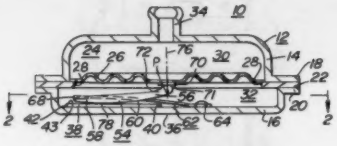
an element movable in response to changing temperature, the movable element actuating the electrical switch means between open and closed conditions at a switching point determined by the axial position of the shaft; and

means for relocating at least one end position for adjustably limiting the range of angular displacement of the shaft between the two end positions so as to limit the range of shaft axial movement and therefore determine the range of switching points.

## 4,214,225
## SIGNAL TRANSDUCING DEVICE

Laurence N. Wesson, Collegeville, Pa., assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 26, 1978, Ser. No. 972,874
Int. Cl.[2] H01C 10/00
U.S. Cl. 338—155 18 Claims



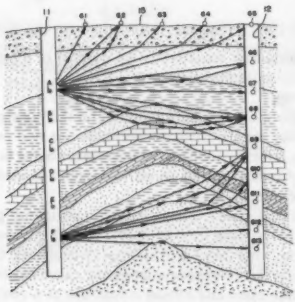
1. A signal transducing device comprising a first element having a contact surface with a conductive path, a second element having an arcuate contact surface with an arcuate non circular conductive path and being movable with respect to and engaging by rocking action the contact surface of the first element, the conductive paths of the elements electrically contacting each other at a location which is displaceable along their paths with the movement of the second element, positioning means for retaining the elements for relative movement, actuating means for moving and positioning the second element with respect to the first element and controlling the contact location of the elements, the actuating means engaging the second element and being displaceable in a predetermined direction for moving the second element, the displacement in the predetermined direction of the actuating means having a linear relationship to the displacement of the contact location along the paths of the elements, and connecting means electrically joined with the conductive paths of the first and second elements for providing an output signal determined by the position of one element with respect to the other.

---

## 4,214,226
## SYSTEM FOR PLOTTING SUBSOIL STRUCTURE AND METHOD THEREFOR

Keshavaiyengar Y. Narasimhan, Huntington Beach; Robert Nathan, Pasadena, and Shakkottai P. Parthasarathy, Burbank, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,846
Int. Cl.[2] G01V 1/12, 1/20, 1/34
U.S. Cl. 367—27 5 Claims



1. In a method for obtaining relatively high resolution information of the subsoil structure between two spaced apart boreholes, the steps comprising:

placing a plurality of signal sources at preselected distances from one another in one borehole;

placing a plurality of signal detectors at preselected distances in at least the second borehole;

activating each of said sources in a selected sequence;

receiving at each of said detectors, signals which propagate to said detectors through said subsoil structure as a result of each activated source; and

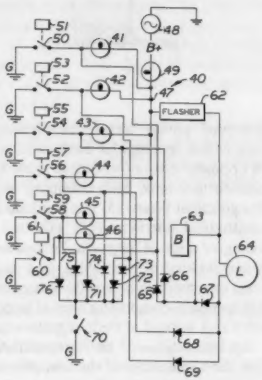
processing the signals received at each detector as a result of the activation of said sources, including signals at frequencies greater than 160 Hz to obtain data adapted to produce subsoil structure information of incremental areas on the order of $(\lambda/3)$ for producing a tomograph of the substructure between said boreholes, where $\lambda$ is the wavelength of processed signals.

---

## 4,214,227
## INSTRUMENT PANEL ASSEMBLY

Stamos I. Papasideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 675,026, Apr. 8, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,135
Int. Cl.[2] G08B 19/00
U.S. Cl. 340—52 F 18 Claims




1. In a signaling system having a plurality of indicator lamps connected in parallel, a corresponding plurality of control switches connected respectively in series with said indicator lamps for selectively energizing said lamps, and an alarm, the improvement comprising

circuit means for connecting said alarm in parallel with a first portion only of said plurality of indicator lamps for concurrent operation of said alarm and first portion of the lamps upon closing of any of the control switches associated therewith to energize the associated indicator lamps of said first portion and permitting energization of the remainder of said lamps by their associated control switches without energization of said alarm.

---

## 4,214,228
## ERROR-CORRECTING AND ERROR-DETECTING SYSTEM

Yasuhiro Nara, Chigasaki; Yukio Sohma, and Akira Hattori, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 5, 1978, Ser. No. 939,488
Claims priority, application Japan, Dec. 23, 1977, 52-155952
Int. Cl.[2] G06F 11/12
U.S. Cl. 371—40 10 Claims

1. A check bits generating system for use in an error-correcting and error-detecting system, having means for performing both a b-bit single burst block error correcting operation and a double burst block error detecting operation in accordance

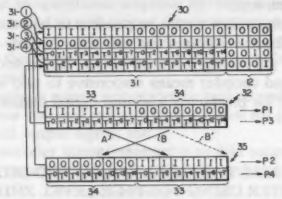
with a (k, l) type check matrix comprising: a check-bits generating circuit, operated in accordance with said (k, l) type check matrix, for receiving input data which is to be checked for errors and for producing an output check-bits code wherein said (k, l) type check matrix is constructed from:

a first means for providing outputs corresponding to submatrices (1) and (2) to said check-bits generating circuit,

said sub-matrix (1) consisting of an (m, l) type reference sub-matrix (where $m<k$), and said sub-matrix (1) is composed of a plurality of (m, n) type unit-matrices (where $n<l$),

said sub-matrix (2) consisting of one or more (m, l) type sub-matrices, each of said one or more (m, l) type sub-matrices is also composed of said plurality of (m, n) type unit-matrices;

shifting means, operatively connected to said check-bits



generating circuit, for shifting the locations of said plurality of (m, n) type unit-matrices in each of said sub-matrices (1) and (2) by a circular shift wherein said locations are different from each other; and

second means, operatively connected to said check-bits generating circuit, for alternately stacking respective rows of said sub-matrix (1) and said sub-matrix (2) by means of reciprocal replacement to compose said (k, l) type check matrix, wherein said check-bits generating circuit is comprised of a plurality of identical circuit units having outputs, said input data is provided to said plurality of identical circuit units, said input data is shifted by said shifting means so that said plurality of identical circuit units function in accordance with said sub-matrix (1) and said sub-matrix (2), said outputs of said plurality of identical circuit units are rearranged by said second means to form said output check-bits code.

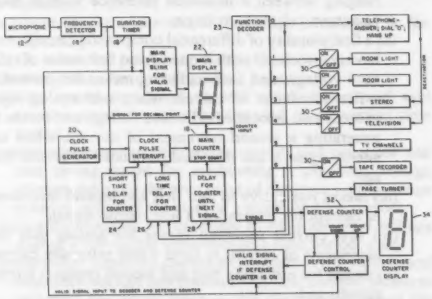
---

**4,214,229**

## REMOTE CONTROL APPARATUS

**William J. Warner, 305 Memorial Dr., Suite 514A, Cambridge, Mass. 02139**

**Filed Nov. 16, 1978, Ser. No. 961,375**
**Int. Cl.[2] H04Q 9/00**
**U.S. Cl. 340—148** **18 Claims**



1. Apparatus for remotely controlling automatic apparatus by means of a user operated transmitter comprising:

(a) means for controlling the frequency of the transmitter;

(b) a receiver for receiving signals from the transmitter within a predetermined frequency range;

(c) means at the receiver for detecting receipt of a signal within the predetermined range and for transmitting back to the transmitter a signal indicating such receipt;

(d) means at the receiver for detecting the duration of a signal received within the predetermined frequency range and for indicating when such a signal has been continuously so received for a predetermined period, and

(e) means at the receiver responsive to signals detected as defined in (c) and (d) for energizing controls,

whereby the user adjusts the frequency to come within the receiver's range, the receiver informs the user when the frequency is correct, thereafter the user holds the signal for the predetermined duration and the receiver informs him when he has succeeded in so doing.

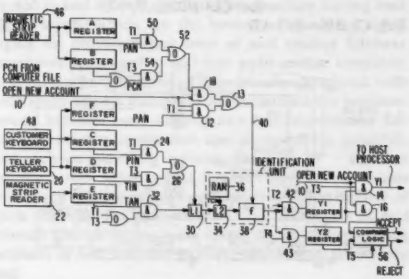
---

**4,214,230**

## PERSONAL IDENTIFICATION SYSTEM

**Viiveke Fak, Ryttaregängen 24, S-58266 Linköping, Sweden; Ingemar B. Ingemarsson, Hedborns gata 2, Linköping, Sweden (S-58249); Rolf Blom, Rydsvägen 318C, Linköping, Sweden; Robert Forchheimer, Braxstigen 5, S-13500 Tyresö, Sweden, and Bjorn I. Hellberg, Ettoresg. 3, 58266 Linköping, Sweden**

**Filed Jan. 19, 1978, Ser. No. 870,818**
**Int. Cl.[2] G06K 7/08; G06F 7/06; H04Q 9/00**
**U.S. Cl. 340—149 A** **11 Claims**



1. For use in a system for providing transaction security to a cardholder's account in a commercial institution, wherein the cardholder has a secret identification number, and the institution has a secret number, the combination comprising:

means having a data input, a data output and a key input, for enciphering clear data applied at said data input under control of a key comprised of key bits applied at said key input, in accordance with an enciphering process;

means for applying a customer account number to the data input of said enciphering means; and,

means for applying at the key input the combination of said customer's secret number and said institution's secret number,

whereby a first cipher is generated at the output of said enciphering means.

---

**4,214,231**

## IN-BORE TELEMETRY INFORMATION MEASURING SYSTEM

**William Donnally, Mine Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

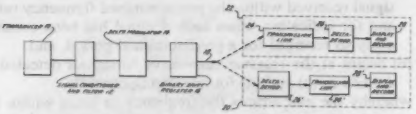
**Filed Mar. 26, 1979, Ser. No. 24,140**
**Int. Cl.[2] H04Q 9/00**
**U.S. Cl. 340—207 R** **13 Claims**

1. An improved electronic system for measuring in-bore

telemetry information for tube-fired munitions where high frequency response up to 20 KHZ is acceptable to telemeter several frequency channels, comprising:

(a) means for sensing a plurality of levels of acceleration, said means disposed inside a tube-fired projectile;

(b) means for conditioning and filtering a signal input;



(c) means for converting analog data by a Delta-Modulation method;

(d) means for binary recirculation, said means accomplishing repetition of measurement of the in-bore information; and

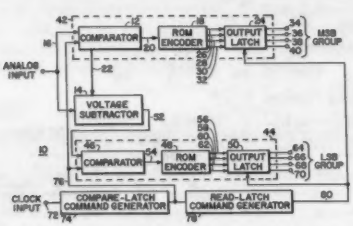
(e) a binary shift register for conveying input digital data to a ground-station facility through a transmission link.

---

## 4,214,232
## SERIAL-PARALLEL ANALOG-TO-DIGITAL CONVERTER USING VOLTAGE SUBTRACTION

**Pern Shaw; Fuad H. Musa, both of Austin, Tex., and Stephen J. Kreinick, San Diego, Calif., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jun. 17, 1977, Ser. No. 807,471**
**Int. Cl.[2] H03K *13/175***
**U.S. Cl. 340—347 AD** **13 Claims**




1. An analog-to-digital converter comprising:

(a) means for receiving an analog signal;

(b) first comparator means responsive to said analog signal and including

(i) means for providing a first series of reference voltages ranging between a minimum voltage and a maximum voltage;

(ii) a first plurality of differential comparison circuits, each having associated with it one of said first series of reference voltages, each of said differential comparison circuits comprising

a current splitting network having first and second terminals for providing first and second increments of current when said analog signal exceeds said associated reference voltage; and

means having a third terminal for providing a third increment of current when said analog signal is less than said associated reference voltage;

(iii) a plurality of first output means each having an output terminal, each of said first output means being coupled to said first terminal of an associated differential comparison circuit and to said third terminal of an adjacent differential comparison circuit, and a pair of second output means each having an output terminal, one of said second output means being coupled to said first terminal of the differential comparison circuit associated with said minimum voltage, and one of said second output means being coupled to said third terminal of the differential comparison circuit associated with said maximum voltage, one of said output means generating a first output signal at its output terminal in the absence of any current increment input to such output means; and

(iv) current summing means responsive to said second terminals for adding said second increments of current to form a reference current;

(c) first encoder means responsive to said first output signal for producing a first digital number;

(d) subtractor means responsive to said analog signal and said reference current for producing an intermediate output signal;

(e) second comparator means responsive to said intermediate output signal and including

(i) means for providing a second series of reference voltages; and

(ii) comparison means responsive to said second series of reference voltages and said intermediate output signal for generating a second output signal; and

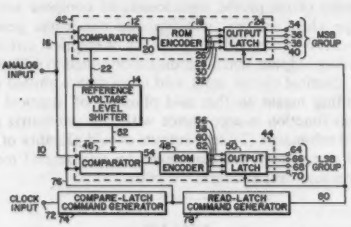
(f) second encoder means responsive to said second output signal for producing a second digital number.

---

## 4,214,233
## SERIAL PARALLEL ANALOG-TO-DIGITAL CONVERTER USING VOLTAGE LEVEL SHIFTING OF A MINIMUM REFERENCE VOLTAGE

**Pern Shaw; Fuad H. Musa, both of Austin, Tex., and Stephen J. Kreinick, San Diego, Calif., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jun. 17, 1977, Ser. No. 807,472**
**Int. Cl.[2] H03K *13/175***
**U.S. Cl. 340—347 AD** **4 Claims**




1. An analog-to-digital converter comprising:

(a) means for receiving an analog signal;

(b) first comparator means responsive to said analog signal and including

(i) means for providing a first series of reference voltages ranging between a minimum reference voltage and a maximum reference voltage;

(ii) a first plurality of differential comparison circuits, each having associated with it one of said first series of reference voltages and each including means for generating a first increment of current when said analog signal exceeds said associated reference voltage and means for generating a second increment of current when said analog signal is less than said associated reference voltage;

(iii) means responsive to said first and second increments of current for generating a first output signal;

(iv) first current summing means for adding said first increments of current to form a first reference current;

(v) means for providing first and second constant current signals; and

(vi) second current summing means for adding said first reference current and said first constant current signal to produce a second reference current;

(c) first encoder means responsive to said first output signal for producing a first digital number;
(d) a reference voltage level shifting circuit comprising
(i) a current mirror circuit having a first terminal responsive to said second reference current and a second terminal, said current mirror circuit producing at said second terminal a mirror current equal in magnitude to said second reference current; and
(ii) resistance means having a first terminal coupled to said minimum reference voltage and a second terminal coupled to the second terminal of said current mirror circuit and providing a shifted maximum reference voltage;
(e) second comparator means including
(i) means for providing a second series of reference voltages, said means comprising a resistive ladder network having first and second terminals, said first terminal being coupled to said shifted maximum reference voltage, and an operational amplifier having a non-inverting input coupled to said second constant current signal, an output, and an inverting input coupled to said output and to the second terminal of said resistive ladder network; and
(ii) comparison means responsive to said second series of reference voltages and said analog signal for generating a second output signal; and
(f) second encoder means responsive to said second output signal for producing a second digital number.

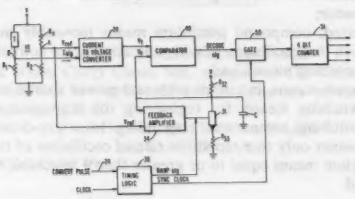
---

**4,214,234**

## RANGE TRACKING ANALOG TO DIGITAL CONVERTER FOR USE WITH A BRIDGE

**Joseph E. Cunningham, Jr., Boulder, and Anthony Grombone, Lafayette, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Feb. 5, 1979, Ser. No. 9,329**
**Int. Cl.² H03K *13/20***
**U.S. Cl. 340—347 AD** **1 Claim**



1. A range-tracking circuit whose output is independent of variations in supply voltage comprising:
means including a bridge circuit for producing an error voltage proportional to changes in a sensed condition;
a capacitor;
a power supply connected to the bridge circuit and to the capacitor;
clock means for producing clock pulses;
counter means for counting clock pulses;
timing means connected to said clock means and said counter means for initiating the start of a counting time period;
means connected to said bridge circuit, said capacitor and said timing means for establishing a capacitor voltage corresponding to the zero point of the error voltage range prior to initiating the start of a counting time period;
means for charging the capacitor to full-scale error voltage during a full digital scale counting time period; and
comparator means connected to compare error voltage and capacitor voltage and connected to said counter means to interrupt the count prior to full digital scale when the error is less than full scale,
whereby the count produced by the counter means represents error in the sensed condition independent of supply voltage variation.

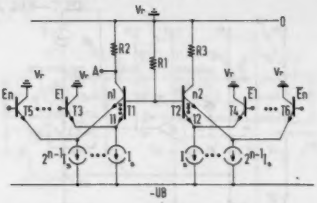
---

**4,214,235**

## DIGITAL TO ANALOG CONVERTER USING MULTIPLE EMITTER TRANSISTORS

**Fritz Meyer, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed May 21, 1979, Ser. No. 40,702**
**Int. Cl.² H03K *13/02***
**U.S. Cl. 340—347 DA** **6 Claims**



1. A circuit for the generation of $2^n$-step digital signals from n-binary signals of a very high bit rate comprising:
a base-coupled differential amplifier having first and second multi-emitter transistors each having n emitters respectively connected to n emitter follower transistors having base signal inputs, with emitter follower transistors connected to said second multi-emitter transistor having base signal inputs which are the inverse of the base signal inputs for corresponding ones of said emitter follower transistors connected to said first multi-emitter transistor;
two sets of n current sources respectively associated with each multi-emitter transistor, one current source interconnected between each multi-emitter transistor-emitter follower transistor connection and an operating potential, and each set providing currents which are $2^{n-1}$ times an initial current value with a lowest-value current source from each set respectively connected to a first emitter of each multi-emitter transistor and the remainder of said current sources respectively connected to corresponding emitters of said first and second multi-emitter transistors; and
an output tap connected to the collector of said first multi-emitter transistor.

---

**4,214,236**

## DRIVER CIRCUIT FOR AN ELECTRICAL LOAD WITH CAPABILITY FOR DETECTING A SHORT IN THE LOAD

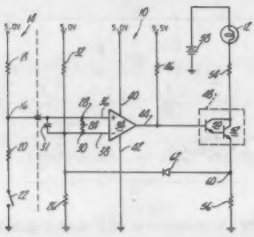
**Ralph W. Carp, and William R. Groff, both of Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Oct. 2, 1978, Ser. No. 947,787**
**Int. Cl.² G08B *21/00***
**U.S. Cl. 340—642** **8 Claims**

1. A driver circuit for use with a programmable electronic logic device of the type having at least one bidirectional input-/output (I/O) terminal which is pulled up to a normally logic high state when unloaded and pulled down to a logic low state when loaded and further having program-controlled internal switching means for pulling down the I/O terminal to a logic low state by program control, the driver circuit being adapted to drive a d.c. electrical load under normal load conditions and respond to a shorted load under abnormal load conditions, the circuit comprising:
a voltage sensing circuit connected between the I/O terminal and a reference potential, the voltage sensing circuit having an I/O terminal sensing point and an output feedback sensing point, the voltage at the I/O terminal sensing point being normally greater than the voltage at the output feedback sensing point under normal load conditions;

comparator means, connected to the voltage sensing circuit and responsive to the voltage difference between the I/O terminal sensing point and the output feedback sensing point, for comparing the voltages at the sensing points and producing an output signal at a first level when the I/O terminal sensing point voltage exceeds the output feedback sensing point voltage, and at a second level when the output feedback sensing point voltage exceeds the I/O terminal sensing point voltage;

driver switch means, responsive to the output signal of the comparator means, for enabling energization of the electrical load upon the occurrence of a comparator output



signal at the first level and disabling energization of the load upon the occurrence of a comparator output signal at the second level; and

output feedback means, connected between the driver switch means and the output feedback sensing point, for communicating a feedback voltage to the output feedback sensing point upon the occurrence of a short condition to cause the voltages at the output feedback sensing point and I/O terminal sensing point to enter a logic high state that can be detected by program logic and used to cause the internal switch means to close and pull down the I/O terminal, thereby disabling energization of the electrical load.

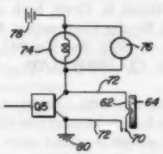
---

**4,214,237**

**ELECTRICAL INDICATOR MEANS FOR INDICATING THE CORRECT POSITION OF A CASETTE IN FLOW CONTROLLING**

**Nicholas Zissimopoulos, Schaumburg, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Feb. 21, 1979, Ser. No. 12,989**
**Int. Cl.[2] G07F *11/60*; G08B *21/00***
**U.S. Cl. 340—686** **6 Claims**



1. In flow controlling apparatus including a separate casette defining a liquid flow path, and a controller adapted to receive and hold said casette, the improvement comprising, in combination:

means for indicating the correct positioning of the casette in the controller, said means comprising: a rotationally movable member, movable in a manner relating to the position of the casette, and a bearing member, one of said members defining a projection adapted to bear against the other member; an electrical switch adapted to be opened and closed by one of said members; a recess defined in the member which does not carry the projection, said recess being adapted to receive the projection in the position of the rotationally movable member when the casette is correctly positioned in the controller;

and alarm means operated by said switch, whereby said switch is closed to operate said alarm means when the projection of the movable member is spaced from said recess, and said switch is open when said projection is positioned in the recess.

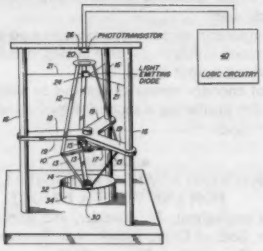
---

**4,214,238**

**SEISMIC TRIGGER**

**William M. Adams, Honolulu, Hi.; Robert F. Blakely, Bloomington, Ind.; Charles R. Ellis, Bloomington, Ind., and Judson Mead, Bloomington, Ind., assignors to Indiana University Foundation, Bloomington, Ind.**

**Filed Mar. 8, 1977, Ser. No. 775,591**
**Int. Cl.[2] G08B *21/00***
**U.S. Cl. 340—690** **10 Claims**




1. A device for detecting seismic variances comprising:

a power source;

photoelectric switching means in circuit with said power source;

inverted, compound pendulum means moveably mounted such that oscillation of said pendulum means activates said switching means; and

response means, in circuit with said power source and said switching means, for registering the activation of said switching means and responding in a pre-determined manner only to a repetition rate of oscillation of the pendulum means equal to or greater than a selectable threshold.

---

**4,214,239**

**MAGNETIC DRUM STORAGE FOR THE TRACK BEFORE DETECT SYSTEM**

**George M. Dillard, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 2, 1963, Ser. No. 270,119**
**Int. Cl.[2] G01S *9/02***
**U.S. Cl. 343—5 VQ** **6 Claims**

1. A track detection system comprising;

receiving means for receiving reflected radio frequency signals from an object in a given medium;

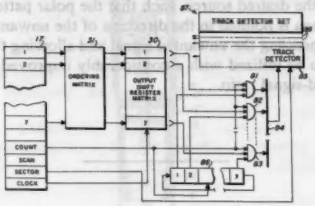
said receiving means for receiving said signals at a predetermined scan rate;

storage means operatively coupled to said receiving means for storing information corresponding to reflected radio frequency signals from an object in a given medium;

referencing means included in said storage means for referencing received reflected radio frequency signals with respect to the azimuth from which the reflected information is received during a scan of said receiving means;

said storage means being adapted for storing a multitude of scans;

ordering means operatively coupled to said storage means for accepting information from said storage means and sorting said information according to range and sector where range is broken up into a discrete number of increments referred to as range bins and where range is the distance from the receiving means to an object in a medium and sector is the azimuth from which a signal is received at a given time;




other storage means operatively connected to said ordering means for storing information corresponding to the number of hits per range bin where hits are defined as the times when an object is illuminated by radio frequency energy; said number of hits per range bin having been stored in said first mentioned storage means as range information; and

track detector means operatively connected to said other storage means for making a decision as to the absence or presence of a track in the medium.

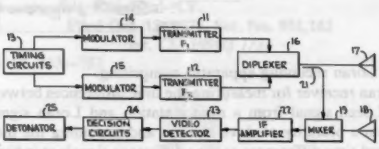
---

**4,214,240**

## CODED PULSE RADAR FUZE

**Frank Weiss, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 3, 1964, Ser. No. 416,684**
**Int. Cl.[3] F42C *13/04***
**U.S. Cl. 343—7 PF** **11 Claims**




1. A coded pulse radar proximity fuze with improved electronic countermeasure protection, comprising:

(a) transmitting means for radiating a recurring sequence of three pulses of two alternate frequencies at a target, each of said pulses being separated in time by the desired radar round trip delay time and each of said sequences of pulses being separated in time by a greater time than the desired radar round trip delay time;

(b) means for receiving reflections of said recurring sequence of three pulses radiated at a target by said transmitting means;

(c) means connected to said receiving means and to said transmitting means for combining the output of said receiving means with a portion of the output of said transmitting means;

(d) means connected to said combining means for amplifying that portion of the output of said combining means having a frequency equal to the difference between said two alternate frequencies; and

(e) means connected to said means for amplifying for detecting a sequence of two pulses separated in time by the desired radar round trip delay time.

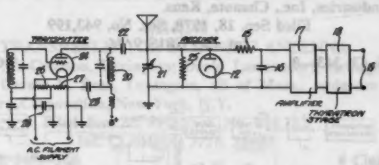
---

**4,214,241**

## PROXIMITY CONTROL SYSTEM

**Joseph C. Tellier, 4005 Redden Rd., Drexel Hill, Pa. 19026**

**Filed Mar. 11, 1944, Ser. No. 526,037**
**Int. Cl.[2] G01S *9/02***
**U.S. Cl. 343—7 PF** **2 Claims**




1. In a proximity-controlled bomb adapted to be dropped upon a target and adapted to reach a fixed velocity, a fixed radio-frequency control mechanism comprising a continuous wave radio transmitter and receiver operating at a fixed frequency and having a fixedly tuned network in common, an antenna coupled to said network, a detector coupled to said network for deriving a difference-frequency signal by heterodyning the transmitted wave and the wave reflected from said target, and means coupled to said detector and responsive to signal amplitudes derived only when said bomb and target reach a predetermined proximity.

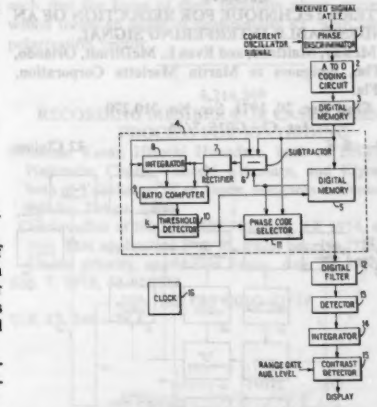
---

**4,214,242**

## METHOD AND APPARATUS FOR ELIMINATING MULTIPLE-TIME ECHOES IN PULSE DOPPLER RADARS

**Jean-Marie H. Colin, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Dec. 6, 1978, Ser. No. 967,076**
**Claims priority, application France, Dec. 8, 1977, 77 36971**
**Int. Cl.[2] G01S *9/42***
**U.S. Cl. 343—7.7** **6 Claims**




1. A method for decreasing the effect of multiple-time echoes in the receiving signals of pulse Doppler radar apparatus of the type employing unequal transmitted pulse spacing and coherent only on reception, comprising the steps of:

computing within each range gate, the absolute value of the difference between the last two phase pulses received;

comparing the computed absolute value thus obtained to the average of N absolute values previously computed;

determining the presence of a multiple-time echo whenever the last of said absolute values is at least k times greater than the average of the preceding N absolute values; and

substituting the last previous phase pulse for that detected in a range gate in which said absolute value is greater than k times the average of said preceding N absolute values.

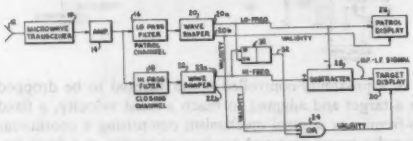
---

## 4,214,243

## HARMONIC DETECTOR FOR TRAFFIC RADAR

Robert E. Patterson, Lee's Summit, Mo., assignor to M. P. H. Industries, Inc., Chanute, Kans.

Filed Sep. 18, 1978, Ser. No. 943,199
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 9 Claims




8. In a traffic radar receiver for use on a moving patrol vehicle, a method of identifying a target vehicle and determining the speed thereof, said method comprising the steps of:

receiving a Doppler signal having a low frequency component representing the speed of the patrol vehicle;

deriving from said Doppler signal a low frequency speed signal corresponding to said low frequency component, and a high frequency speed signal of unknown validity;

recognizing the phase relationship between the two speed signals;

deriving target speed information from said speed signals; and

displaying said speed information unless the phase relationship between the two speed signals remains constant for a predetermined period of time, whereby speed information is not displayed if said low and high frequency speed signals are phase coherent.

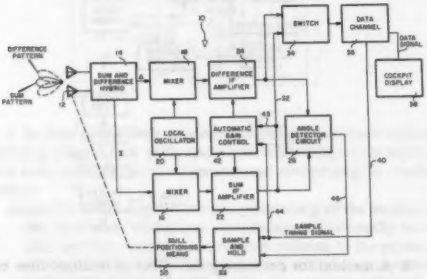
---

## 4,214,244

## NULL PATTERN TECHNIQUE FOR REDUCTION OF AN UNDESIRABLE INTERFERING SIGNAL

Michael W. McKay, Maitland, and Evan L. McDirmit, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Dec. 20, 1971, Ser. No. 210,270
Int. Cl.[2] G01S 7/36
U.S. Cl. 343—18 E 22 Claims




8. A null pattern angle tracking technique for reducing the effect of an undesirable cofrequency interfering signal in a data link channel comprising at least one antenna operative in the electromagnetic domain and having the capability of producing at least one sharp angular null as measured in its polar pattern amplitude characteristic, detector means for recovering desired information from a remote data channel transmitter that is substantially continuously interrupted, as well as making apparent the existence of an unwanted signal, means for redirecting the polar pattern amplitude characteristic of said antenna means such that angle tracking from the desired source is accomplished, means enabling any unwanted signal present to be utilized during such interruptions of the desired signal for redirecting the antenna by the unwanted signal source rather than by the desired source, such that the polar pattern null of the antenna is pointed in the direction of the unwanted signal, thus suppressing the unwanted signal and allowing the desired source to be utilized with a considerably improved signal-to-unwanted-signal ratio.

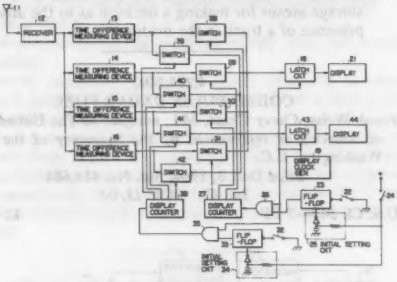
---

## 4,214,245

## LORAN RECEIVING APPARATUS

Teruhisa Fujino, Kawasaki; Fujio Osawa, Tama; Noriaki Nagao, Toshima, and Shigeo Hanji, Musashino, all of Japan, assignors to Kabushiki Kaisha Koden Seisakusho, Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 944,522
Claims priority, application Japan, Sep. 26, 1977, 52-114763; Nov. 9, 1977, 52-150204[U]
Int. Cl.[2] G01S 1/24
U.S. Cl. 343—103 13 Claims




1. A Loran receiving apparatus comprising:

a Loran receiver for measuring the time differences between a Loran signal from a master station and Loran signals from a plurality of slave stations and providing the measured time differences as time difference signals at individual measured output terminals;

display mode changeover means manually controlled to set first and second display modes alternately with each other;

a display for providing a display of each time difference signal supplied thereto;

means for supplying the time difference signals at the measured output terminals to said display in a repeating cyclic order when the display mode changeover means is set in the first display mode; and

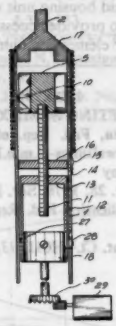
means for continuously supplying to said display that one of the time difference signals which is supplied to said display in the first display mode immediately before the first display mode is switched to the second one when said display mode changeover means is set in the second display mode.

4,214,246

## CONTINUALLY ADJUSTABLE FREQUENCY ANTENNA

Juan M. Arechavala, Diagonal Norte, 825-Buenos Aires, Argentina

Filed Nov. 29, 1978, Ser. No. 964,397
Claims priority, application Argentina, Jan. 20, 1978, 274490; Jan. 29, 1978, 270164
Int. Cl.² H01Q 9/00
U.S. Cl. 343—750 6 Claims



1. A continually adjustable frequency antenna, comprising
(a) a supporting tube connected to an antenna and having a winding on its exterior;
(b) a sliding piston mounted for upward and downward movement within said supporting tube and having means thereon preventing it from rotating with respect to said supporting tube;
(c) a threaded rod attached by one of its ends to said sliding piston;
(d) a second tube within said supporting tube and receiving said threaded rod when said sliding piston moves downwardly;
(e) means for rotatably driving said second tube;
(f) said threaded rod being moved from its uppermost to its lowermost position by a rotating nut located at one end of said second tube.

4,214,247

## TUNABLE FIBERGLASS WHIP ANTENNA

Thomas A. Richmond, Middletown, N.Y., assignor to Avnet, Incorporated, Ellenville, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,162
Int. Cl.² H01Q 1/36
U.S. Cl. 343—752 1 Claim

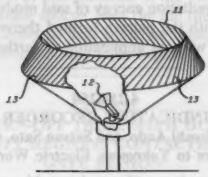
1. A tunable fiberglass whip antenna comprising an elongated tubular fiberglass core having a two-step axial bore at its upper end, a conductive coil wrapped around the exterior surface of said fiberglass core with the upper portion of said coil being tightly wound and enveloping said bore, an internally threaded insert secured at the bottom of the large diameter section of said bore near the top of said coil, and a metallic screw in threaded engagement with the insert and adapted to extend through said insert from beyond the top of said coil into the small diameter portion of said bore, whereby said screw may be longitudinally adjusted relative to said tightly wound coil by rotation of said screw within said insert to thereby vary the inductive coupling between said tightly wound coil and said screw, said core and coil are enveloped in a plastic shrink tube, the open end of said axial bore being enclosed by a cap.

4,214,248

## TRANSREFLECTOR SCANNING ANTENNA

Harry M. Cronson, Lexington; David Lamensdorf, Arlington, and Gerald F. Ross, Lexington, all of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 918,182
Int. Cl.² H01Q 3/18, 15/24
U.S. Cl. 343—756 6 Claims



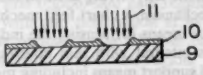
1. An antenna of the type that includes a transreflector and a feed antenna therefor, said transreflector having an internal focal circle and created by a plurality of reflecting elements arranged on a surface of revolution formed about a generating axis whereon each of said reflecting elements is in an angular relationship of substantially 45° with each crossed meridian of said surface of revolution, wherein said feed antenna comprises an array of simultaneously operable radiation devices each oriented to provide a radiation polarization vector when radiating that is substantially parallel to directly illuminated reflecting elements and positioned with respect to one another such that the locus of their radiation phase centers is a line which forms an angle of substantially 45° with said radiation polarization vector.

4,214,249

## RECORDING MEMBER FOR LASER BEAM AND PROCESS FOR RECORDING

Masanao Kasai; Hitoshi Hanadate, both of Tokyo; Yoshioki Hajimoto, Chofu; Takashi Kitamura, and Kiyonobu Endo, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 497,741, Aug. 15, 1974, abandoned. This application Sep. 21, 1976, Ser. No. 725,348
Claims priority, application Japan, Aug. 20, 1973, 48/93188; Sep. 7, 1973, 48/100833
Int. Cl.² G01G 15/34
U.S. Cl. 346—76 L 10 Claims



1. A laser beam recording member which consists essentially of a recording layer disposed on a surface of a support and which has information in said recording layer in the form of a

groove which extends at least to said surface of said support and which is formed directly therein by evaporation of the recording layer by means of the radiation energy of a laser beam in those portions exposed to the laser beam without application of further means, wherein said recording layer is from 10 microns 10 millimicrons in thickness and is composed of a non-metallic layer composed of a member selected from the group consisting of the chalcogen elements S, Se and Te, mixtures thereof and a chalcogenide compound of at least one of S, Se and Te with at least one of As, Bi, Sb, Ge, Si, Sn, In, Zn, Fe, Cu, Ag, Ni, Al, V and Pb.

4. A process for laser beam recording which comprises exposing a recording member to a modulated laser beam, said recording member comprising a recording layer which is disposed on a surface of a support and which comprises a non-metallic layer which is from 10 microns to 10 millimicrons in thickness and is composed of a member selected from the group consisting of the chalcogen elements, S, Se and Te, mixtures thereof and a chalcogenide compound of at least one of S, Se and Te with at least one of As, Bi, Sb, Ge, Si, Sn, In, Zn, Fe, Cu, Ag, Ni, Al, V and Pb to thereby record information in the recording layer in the form of a groove which extends at least to said surface of said support and which is formed directly therein by evaporation of the recording layer by means of the radiation energy of said modulated laser beam in accordance with the pattern formed thereon by the modulated laser beam without application of further means.

---

**4,214,250**

## INDICATING RECORDER

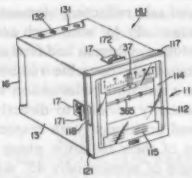
**Hisaya Fujita; Hiroshi Ando, and Setsuo Sato, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan**

**Filed Oct. 17, 1978, Ser. No. 952,151**

**Claims priority, application Japan, Nov. 14, 1977, 52-136417**

**Int. Cl.² G01D *15/00***

**U.S. Cl. 346—145** **7 Claims**



1. An indicating recorder comprising:

a housing unit having a front door, said housing unit being composed entirely of a square prismatic housing;

an internal frame unit located within said housing unit behind said front door;

said internal frame unit comprising (1) left and right side plates positioned respectively adjacent the corresponding sides of said housing unit, (2) an upper beam extending transversely between said side plates, (3) a lower beam extending transversely between said side plates, and (4) a recording chart holder also extending transversely between said side plates;

said beams and said chart holder being formed as shapes having uniform cross-sections;

said internal frame unit having secured thereto an indicating recorder mechanism, a chart feed mechanism and electrical resistance means for sensing the indicator position;

support means integral with said housing unit at one side thereof, said support means including means to accommodate swinging movement of a device supported thereby about a vertical axis;

means mounting said internal frame unit on said support means to provide for swinging movement of said frame unit about said vertical axis, into and out of said housing unit;

an electric power source unit located in a space in said housing unit separate from said swingable internal frame unit, said electric power source unit comprising a unit frame fixedly secured to said housing unit independently of said frame unit; and

an electric power transformer and terminal board means forming part of said power source unit to remain fixed in position within said housing unit when said frame unit has been swung out to provide access to said recorder mechanism or the other elements mounted on said frame unit.

---

**4,214,251**

## RADIATION-EMITTING SEMICONDUCTOR DIODE

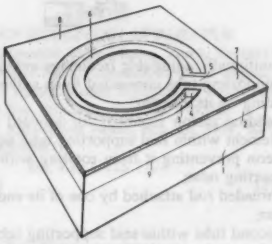
**Werner Schairer, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 28, 1978, Ser. No. 964,141**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755433**

**Int. Cl.² H01L *33/00***

**U.S. Cl. 357—17** **6 Claims**



1. A radiation-emitting semiconductor diode having a pn-junction which runs parallel to a main surface of the semiconductor body, characterized in that the pn-junction is limited by a groove which is interrupted at one point by means of a web for a conductor track running on the web, and a connection is made between an electrode, located inside the region of the semiconductor surface enclosed by the groove, and a connection surface located outside the region of the semiconductor surface enclosed by the groove.

---

**4,214,252**

## SEMICONDUCTOR DEVICE HAVING A MOS-CAPACITOR

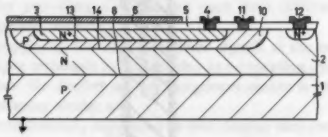
**Joachim Goerth, Lüneburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 31, 1978, Ser. No. 929,442**

**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735529; Jun. 15, 1978, 2826192**

**Int. Cl.² H01G *29/78***

**U.S. Cl. 357—23** **7 Claims**



1. A semiconductor device comprising a semiconductor substrate of first conductivity type; a semiconductor layer of second conductivity type overlying said semiconductor substrate; an insulating layer on said semiconductor layer; a con-

ductive layer formed on said insulating layer; a highly doped zone of said second conductivity type formed in the surface of said semiconductor layer; said highly doped zone, said insulating layer, and said conductive layer forming a MOS-capacitor; a further zone of said first conductivity type entirely surrounding said highly doped zone and interposed between said highly doped zone and said semiconductor layer; and a separate connection electrode at each of said highly doped zone, said further zone, and said semiconductor layer.

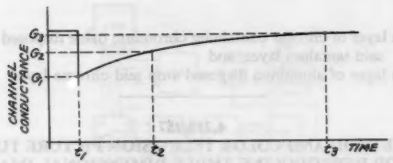
---

**4,214,253**

## RADIATION DETECTOR

**Robert N. Hall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 13, 1977, Ser. No. 805,857**
**Int. Cl.² H01L *27/14***
**U.S. Cl. 397—29** **9 Claims**




1. A semiconductor device comprising:
an elongated-shaped body of monocrystalline semiconductor material having a longitudinal dimension,
said body including a first elongated-shaped region of a one conductivity type located entirely within and generally conforming to the shape of said body, and a second region of the opposite conductivity type completely enclosing said first region and forming a PN junction therewith completely contained within said body,
a first ohmic contact to said second region at one end of said longitudinal dimension and a second ohmic contact to said second region at the other end of said longitudinal dimension.

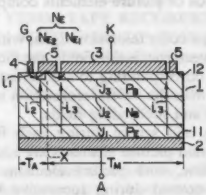
---

**4,214,254**

## AMPLIFIED GATE SEMICONDUCTOR CONTROLLED RECTIFIER WITH REDUCED LIFETIME IN AUXILIARY THYRISTOR PORTION

**Shin Kimura; Hiroshi Fukui, both of Hitachi, and Yoshio Terasawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 1, 1978, Ser. No. 882,332**
**Claims priority, application Japan, Mar. 9, 1977, 52-25580**
**Int. Cl.² H01L *29/74***
**U.S. Cl. 357—38** **10 Claims**




1. A semiconductor rectifier comprising
a semiconductor substrate having a pair of main surfaces and consisting of four alternate P-type and N-type layers continuously formed between said pair of main surfaces, any contiguous layers defining a PN junction between them, one of said main surfaces consisting of exposed surfaces of one outermost layer and one intermediate layer and the other main surface being the exposed surface of the other outermost layer, and said one outermost layer consisting of a main region and an auxiliary region having a smaller area than said main region and separated from said main region by said one intermediate layer;
a first main electrode disposed on said one main surface of said semiconductor substrate and kept in ohmic contact with said main region;
a second main electrode disposed on said other main surface of said semiconductor substrate and kept in ohmic contact with said other outermost layer;
a gate electrode disposed on said one main surface of said semiconductor substrate and kept in ohmic contact with the portion of said one intermediate layer in the neighborhood of said auxiliary region; and
an auxiliary gate electrode disposed on said one main surface of said semiconductor substrate, extended on said one intermediate layer along the periphery of said main region and having its portion in ohmic contact with said auxiliary region, wherein the life time of the carriers in a first portion of said substrate which registers on the projection of said auxiliary region in the direction perpendicular to said one main surface and the life time of the carriers in a second portion of said substrate in the vicinity of said first portion are made shorter than the life time of the carriers in a third portion of said substrate which registers on a similar projection of said main region.

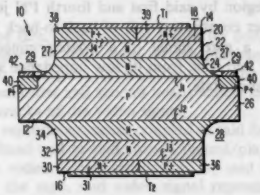
---

**4,214,255**

## GATE TURN-OFF TRIAC WITH DUAL LOW CONDUCTIVITY REGIONS CONTACTING CENTRAL GATE REGION

**John M. S. Neilson, Mountaintop, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 7, 1977, Ser. No. 849,398**
**Claims priority, application United Kingdom, Feb. 7, 1977, 04944/77**
**Int. Cl.² H01L *29/747***
**U.S. Cl. 357—39** **17 Claims**



1. A gate turn-off semiconductor triac device having first and second main terminals and a gate electrode and capable (1) when it is in its high impedance state of blocking voltages applied across its main terminals in either polarity and (2) of being placed in a low impedance state for conducting current in a direction determined by the polarity of the voltage applied across its main terminals, said gate turn-off semiconductor triac device comprising:
a body of semiconductor material having first and second major sides;
a first region having a first conductivity type;
a gate region having a second conductivity type disposed adjacent said first region, said gate region forming a first PN junction with said first region at its interface therewith, said gate region having a higher conductivity than the adjacent portion of said first region;
a second region having said first conductivity type disposed adjacent said gate region and forming a second PN junction with said gate region at its interface therewith, the portion of said second region adjacent said gate region

having a lower conductivity than said gate region, said second region being spaced apart from said first region by said gate region;

a first first-type emitter region having said first conductivity type disposed adjacent said first region and said first major side of said body of semiconductor material, said first first-type emitter region being spaced from said gate region by said first region;

a second first-type emitter region having said first conductivity type disposed adjacent said second region and said second major surface of said body of semiconductor material, said second first-type emitter region being spaced from said gate region by said second region;

a first second-type emitter region having said second conductivity type disposed adjacent said second region and said second major side of said body of semiconductor material, said first second-type emitter region forming a third PN junction with said second region at its interface therewith, said first second-type emitter region being spaced apart from said gate region by said second region;

a second second-type emitter region having said second conductivity type disposed adjacent said first region and said first major side of said body of semiconductor material, said second second-type emitter region forming a fourth PN junction with said first region at its interface therewith, said second second-type emitter region being spaced apart from said gate region by said first region;

first main terminal means disposed adjacent said first major side of said body of semiconductor material and contacting said first first-type emitter region and said second second-type emitter region;

second main terminal means disposed adjacent said second major side of said body of semiconductor material and contacting said second first-type emitter region and said first second-type emitter region;

gate electrode means contacting said gate region;

said first second-type emitter region isolated from said gate region by said second and third PN junctions which together constitute a pair of back-to-back PN junctions;

said second second-type emitter region isolated from said gate region by said first and fourth PN junctions which together constitute a pair of back-to-back PN junctions;

whereby a gate signal of a predetermined polarity can switch said triac from its low impedance state to its high impedance state.

---

**4,214,256**

## TANTALUM SEMICONDUCTOR CONTACTS AND METHOD FOR FABRICATING SAME

**Hormazdyar M. Dalal, Wappingers Falls; Majid Ghafghaichi, Poughkeepsie; Lucian A. Kasprzak, Hopewell Junction, and Hans Wimpfheimer, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 827,912, Aug. 26, 1977. This application Sep. 8, 1978, Ser. No. 941,100**

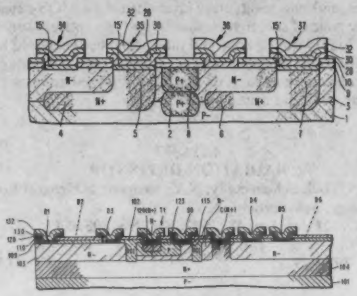
**Int. Cl.[2] H01L *23/48, 29/46, 29/54***

**U.S. Cl. 357—71** **6 Claims**

1. A semiconductor contact comprising:

a silicon semiconductor substrate;

a layer of tantalum disposed atop said substrate;



a layer of chrome containing chromium oxide disposed atop said tantalum layer; and

a layer of aluminum disposed atop said chrome layer.

---

**4,214,257**

## METHOD AND COLOR TELEVISION PICTURE TUBE FOR REPRODUCING THREE-DIMENSIONAL IMAGE

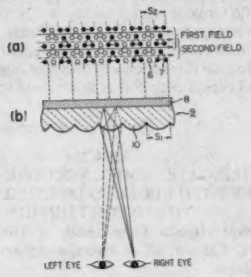
**Satoshi Yamauchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Oct. 4, 1978, Ser. No. 948,477**

**Claims priority, application Japan, Nov. 10, 1977, 52-121757**

**Int. Cl.[2] H04N *9/60***

**U.S. Cl. 358—3** **7 Claims**




1. A stereoscopic color television image reproducing system, comprising:

a color television picture tube having a screen comprising a multiplicity of trios of picture elements comprising color dots or strips;

means for providing a color television signal with horizontal line interlace between successive fields, the video information in each field corresponding to a different one of two observation eyes than the video information in the immediately preceding and succeeding fields;

means for scanning said screen during each field so that alternate ones of said picture elements are excited during each horizontal line, with picture elements in vertical alignment being excited during successive lines of the same field, each field forming a vertical strip pattern of effective scan of said picture elements, adjacent fields corresponding to two different observation eyes exciting different picture elements to provide one vertical strip pattern corresponding to a left eye image and another intermeshed vertical strip pattern corresponding to a right eye image, with horizontal line interlace between successive fields; and

a lenticular lens disposed in juxtaposition with said screen and comprising a plurality of vertical lenticules, each lenticule being disposed in alignment with one strip of said left eye image and one strip of said right eye image, to focus said images to stereoscopically reproduce said color television signal.

---

**4,214,258**

## PORTABLE TELEVISION CAMERA AND TAPE RECORDER COMBINATION

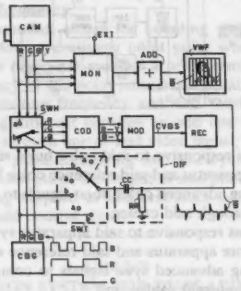
**Nicolaas J. L. van der Valk, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 6, 1978, Ser. No. 958,321**

**Claims priority, application Netherlands, Dec. 7, 1977, 7713500**

**Int. Cl.² H04N** *5/76, 9/62, 9/04*

**U.S. Cl. 358—4** **3 Claims**




1. A portable television camera and tape recorder combination comprising a camera, a tape recording device, a bar generator for testing purposes at the tape recording device, a monitoring device for signal supply to a view finder and a change-over device for supplying the signal of the camera and bar generator, respectively, to the tape recording device, wherein the combination further comprises a superposition stage, coupled between said monitoring device and said view finder, having a first input connected to said monitoring device, a second input, and an output connected to said view finder, and a series arrangement of a signal differentiating circuit and an on-off switching device coupled to said change-over device, said series arrangement being provided between the output of the bar generator and the second input of said superposition stage, whereby when said tape recording device is being supplied with signals from said bar generator, a visual pattern will appear in said view finder indicative of this condition.

---

**4,214,259**

## COLOR VIDEO TAPE RECORDER/REPRODUCER WITH CHROME CORRECTOR

**David T. L. Chang, Palo Alto, Calif., assignor to Recortec, Inc., Sunnyvale, Calif.**

**Filed Apr. 7, 1978, Ser. No. 894,419**

**Int. Cl.² H04N** *5/795*

**U.S. Cl. 358—8** **9 Claims**

1. An EIAJ-2 video tape recorder and reproducer machine for recording a signal representing a video signal which includes luminescence and chrominance information onto a cassette-type video tape and for reproducing the video signal recorded on a cassette-type video tape, said machine comprising:

a rotatable drum;

means for rotating said drum;

a first record/playback head carried by said drum at a first position along its circumference;

a second record/playback head carried by said drum at a second position along said circumference which is diametricallyopposite said first position;

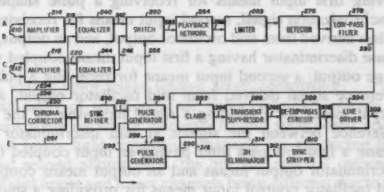
means for transporting a portion of the video tape past said drum, said tape being wrapped about said circumference of said drum so as to define a helical path about at least a 180 degree arc such that as said drum rotates, said first and said second heads define a series of tracks on the tape which are aligned at an acute angle with respect to the length of said tape, said transporting means including capstan means for driving said video tape;

means for rotating said capstan;

modulator means for frequency modulating a carrier signal during the record operation with the video signal including the luminescence and the chrominance information to develop a modulated signal, said modulated signal being coupled to said first and second heads, whereby said modulated signal is recorded onto said series of tracks;

record control means including means for controlling the rotational speed of said drum at a rate commensurate with an increased standard frame rate of said video signal such that an integer number of said tracks greater than one are used to record each field of said video signal, means for recording a control signal having a frequency commensurate with the color frame rate onto said video tape, and capstan controller means for controlling the rotational speed of said capstan during recording at a rate commensurate with said color frame rate;

playback control means including means for reproducing said recorded color frame rate control signal, capstan controller means for controlling the rotation speed of the capstan during playback at a rate commensurate with said




color frame rate, drum control means for controlling the rotatinal speed of said drum during playback at a rate equal with the speed of said drum during recording, whereby said first and second heads access said series of recorded tracks of the video signal;

video signal reproducer means coupled to said first record/playback head and to said second record/playback head to receive video signals reproduced by said heads from tracks on the tape, said video signal reproducer means including video signal splicing means for splicing the portions of the modulated signal developed by said first and second heads to develop a spliced reproduced video signal demodulator means for receiving and decoding said spliced reproduced modulator signal to develop a demodulated reproduced video signal, output terminal means for receiving said reproduced video signal; and chroma corrector means responsive to the rotational speed of the drum and operative to develop a first correction signal when said first record/playback head is accessing the extremities of a respective track and a second correction signal when said second record/playback head is accessing the extremities of a respective track, wherein said video signal reproducer means is responsive to said first correction signal and operative to develop said reproduced modulated signal so as to correct for a decrease in pressure between said first head and the tape at the extremities of the respective track, and responsive to said second correction signal and operative to develop said reproduced modulated signal so as to correct for a decrease in pressure between said second head and the tape at the extremities of the respective track.

## 4,214,260

## CIRCUIT FOR THE LINE SYNCHRONIZATION IN A TELEVISION RECEIVER HAVING A GATED AUXILIARY CONTROL LOOP

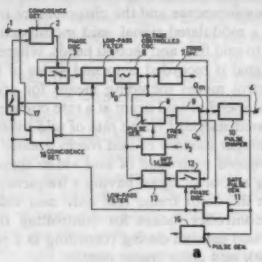
**Jan van Straaten, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 727,714, Sep. 29, 1976, abandoned. This application Sep. 28, 1978, Ser. No. 946,971**

**Claims priority, application Netherlands, Oct. 3, 1975, 7511633**

**Int. Cl.[2] H04N 9/44, 5/04**

**U.S. Cl. 358—17** **10 Claims**



a

1. A line synchronizing circuit comprising an oscillator having a reference signal input, a control input means for controlling at least one of the parameters of frequency and phase of said oscillator, and an output; a coincidence stage having first input means for receiving a pulse shaped line synchronization signal, second input means for receiving gate pulses derived from said oscillator output, and an output, a first phase discriminator having a first input means coupled to said stage output, a second input means for receiving a pulsatory reference signal derived from said oscillator output, and an output means for providing a signal indicative of the phase difference between the signals at said discriminator input means; a first low pass filter having an input coupled to said discriminator output means and an output means coupled to said oscillator control input means for providing a smoothed discriminator output voltage thereto; and an auxiliary control loop means for providing that the central instant of a signal pulse substantially coincides with the central instant of an edge occurring in said reference signal, said loop including a second phase discriminator having two inputs coupled to receive said gate pulses and said reference signal derived from said oscillator output respectively, and an output means for providing a signal in accordance with a possible interval between said instants; and a second low pass filter having an input coupled to said second discriminator output means and an output means coupled to said oscillator reference signal input for applying a smoothed voltage thereto; whereby said interval is reduced to substantially zero.

---

## 4,214,261

## SYNCHRONIZING APPARATUS FOR REMOTE TELEVISION APPARATUS

**Lucas J. Bazin, Vincentown; Gary R. Peterson, Runnemede, and Dennis M. Schneider, Sewell, all of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 11, 1979, Ser. No. 2,726**

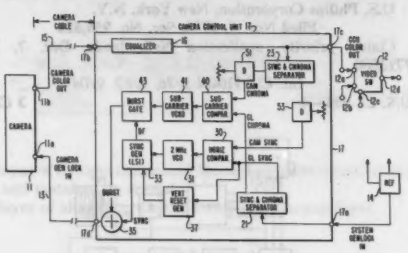
**Int. Cl.[2] H04N 9/46**

**U.S. Cl. 358—19** **7 Claims**

1. A sychronizing apparatus for use in a television system including a remote color television signal generating apparatus of the type having an input terminal adapted to receive a composite sync and burst reference signal from a reference signal source for providing at an output terminal a composite television signal synchronized to the composite sync and burst reference signal, a first cable coupled at one end to said one input terminal of said remote television apparatus and a second cable coupled at one end to said output terminal of said remote television apparatus, comprising:

first means adapted to be coupled to said second cable at the end opposite said one end for separating the sync and color burst signals from said composite television signal from said television apparatus;

second means responsive to said composite sync and burst reference signal from said reference signal source for separating said composite reference signal to provide a separate reference sync signal and reference color burst signal;



third means responsive to said color burst signals from said remote apparatus and said reference color burst signals for generating advanced color burst signals to compensate for delays through said cables;

fourth means responsive to said apparatus sync signals from said remote apparatus and said reference sync signals for generating advanced sync signals to compensate for delays through said cables; and

fifth means adapted to be coupled to said first cable at the end opposite said one end and responsive to said advanced color burst signals and said advanced sync signals for providing to said television apparatus advanced composite sync and color burst reference signals.

---

## 4,214,262

## DIGITAL APPARATUS FOR CORRECTING A TIME-BASE ERROR IN A TELEVISION VIDEO SIGNAL

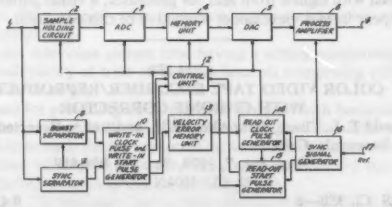
**Mineo Mizukami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Sep. 13, 1978, Ser. No. 941,936**

**Claims priority, application Japan, Sep. 13, 1977, 52-110747**

**Int. Cl.[2] H04N 9/46**

**U.S. Cl. 358—19** **6 Claims**



1. A time-base corrector providing compensation for a time-base error contained in a composite color video signal, said composite color video signal including a horizontal synchronizing signal and a color burst signal, said corrector comprising:

(a) means for generating a first clock pulse train, the frequency of said first clock pulse train being controlled by a control signal and the starting phase of oscillation of said first clock pulse train being determined by a one cycle burst pulse;

(b) means responsive to said first clock pulse train for encoding said composite color video signal into a digitized signal;
(c) means for storing said digitized signal in response to said first clock pulse train;
(d) means for producing a second clock pulse train having a predetermined phase relationship with a reference signal; and
(e) means responsive to said second clock pulse train for reading out the digital signal stored in said memory means; said first clock pulse generating means characterized by;
(f) means responsive to said color burst signal for producing said one-cycle burst pulse, said one-cycle burst pulse having a predetermined phase relationship with said horizontal synchronizing signal and said one-cycle burst pulse being applied to said first clock pulses generating means;
(g) first counting means for counting said first clock pulse train and for generating a third clock pulse train, the frequency of said third clock pulse train being equal to a subcarrier frequency;
(h) second counting means for counting said third clock pulse and for generating a point pulse when said third clock pulse count has reached a predetermined number, the frequency of said point pulse being equal to a horizontal synchronizing frequency and said third clock pulse count being different between an odd line of said video signal and an even line of said video signal; and
(i) means for phase-comparing said one-cycle burst pulse with said point pulse, the output of said phase comparator means being supplied to said first clock pulse generating means as said control signal.

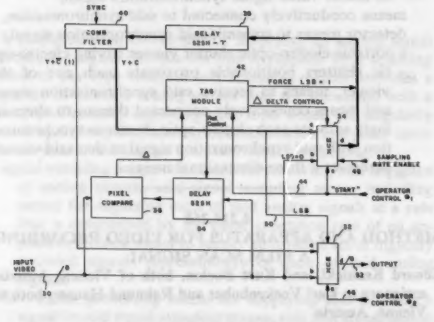
---

**4,214,263**

## TELEVISION SYSTEM FOR DISPLAYING AND RECORDING PATHS OF MOTION

**Arthur Kaiser, Trumbull, Conn., assignor to CBS Inc., New York, N.Y.**

**Filed Sep. 20, 1978, Ser. No. 944,236**
**Int. Cl.[2] H04N** *5/22, 7/18, 5/22*
**U.S. Cl. 358—22** **16 Claims**




1. Method for generating a video signal for displaying simultaneously a succession of images of an object moving over a selectable time period in an otherwise substantially static scene, comprising the steps of:
(a) storing for the duration of a selected time period a reference frame of video representing said scene at the start of a selected time period;
(b) comparing picture elements of selected television frames subsequently arriving during the selected time period with corresponding picture elements of the said reference frame;
(c) separately storing those picture elements of the subsequently arriving frames which are shown by the comparison to be different from those in said reference frame and assigning to the later value for a picture element separately stored priority over an earlier separately stored value derived during the selected time period for the same picture element; and
(d) at the termination of the selected time period, providing a video signal for display representing at least those picture elements separately stored during the selected time period.

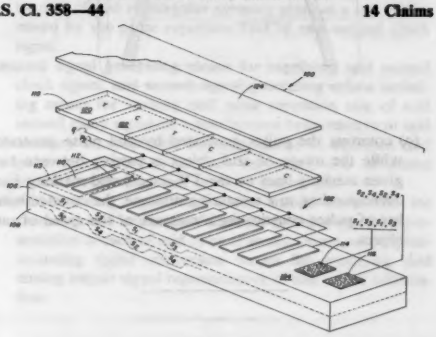
---

**4,214,264**

## HYBRID COLOR IMAGE SENSING ARRAY

**John S. Hayward, Rochester; Benjamin B. Snavely, Fairport, and Pin S. Tschang, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 28, 1979, Ser. No. 15,973**
**Int. Cl.[2] H04N** *9/07;* **H01L** *27/14*
**U.S. Cl. 358—44** **14 Claims**



1. A hybrid color image sensing array, comprising:
(a) an array of semiconductor image sensing elements, at least some of which elements having superposed upper and lower light responsive channels for producing first and second photosignals, the intrinsic spectral responses of said upper and lower channels being different due to the differential absorption of light by a semiconductor material; and
(b) an array of color filter elements disposed over the array of image sensing elements, the array of filter elements having;
(1) elements having a first relative transmittance adapted to tailor the spectral responses of an image sensing element such that the photosignals produced by the element possess a component representing the response of the element to light in a first spectral region and a component representing the response of the element to light in a second spectral region, and
(2) elements having a second relative transmittance adapted to tailor the spectral responses of an image sensing element such that the photosignals produced by the element posssess a component representing the response of the element to light in said first spectral region and a component representing the response of the element to light in a third spectral region.

---

**4,214,265**

## METHOD AND DEVICE FOR SUPERVISING THE SPEED OF AN OBJECT

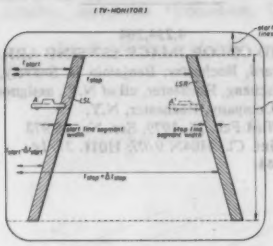
**Lykke Olesen, Granvägen 4, 130 40 Djurhamn, Sweden**

**Continuation-in-part of Ser. No. 731,278, Oct. 12, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,411**
**Claims priority, application Sweden, Oct. 16, 1975, 7511635**
**Int. Cl.[2] H04N** *7/18*
**U.S. Cl. 358—93** **5 Claims**

1. A method for supervising the speed of an object, such as a vehicle, relative to a reference point, comprising the steps of

(a) mounting a TV-camera at said reference point and directing said TV-camera at a certain angle (α) to the direction of movement of said object so that said object will pass substantially sideways in the field of view of the TV-camera;

(b) triggering a pulse generator by means of video signals derived from said TV-camera; and



(c) counting the pulses generated by said pulse generator while the image of said object is passing between two given marking lines on the TV-image, said marking lines corresponding to a measuring distance, the counted number of pulses constituting a measure of the speed of said object.

---

**4,214,266**

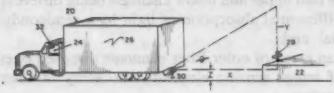
**REAR VIEWING SYSTEM FOR VEHICLES**

**Charles H. Myers, 2848 Scottsdale Dr., San Jose, Calif. 95122**

**Filed Jun. 19, 1978, Ser. No. 916,519**

**Int. Cl.[2] H04N 7/18**

**U.S. Cl. 358—108** **9 Claims**



1. A system for assisting an operator while backing into a given parking site a self-propelled transporter having a forwardly facing operator's station from which the operator's vision directly to the rear of the transporter is blocked by part of the transporter;

a closed circuit video system including rearwardly directed camera means at the rear of the transporter for viewing the zone immediately to the rear of the transporter otherwise blocked from the operator's vision, and a viewing montior at the operator's station operatively connected to the camera means;

distance indicating means for visually indicating at the operator's station, as the transporter is being backed into a parking site, the decreasing distance from the transporter to the rear end of the parking site;

a backing target having a preselected dimensional parameter for placing at the parking site to be viewed by the camera as the transporter is backed toward the parking site; and

legend means coupled to said viewing monitor in said video system for providing an indication at said monitor, as the transporter approaches said target while being backed, of the decreasing distance from the transporter to the backing target by utilizing the correspondingly increasing size of the preselected dimensional parameter of the backing target image appearing at the monitor.

**4,214,267**

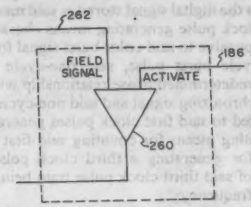
**STEREOFLUOROSCOPY SYSTEM**

**John A. Roese, 6315 Camino Corto, San Diego, Calif. 92120, and A. Franklin Turner, 748 S. El Molino Ave., Pasadena, Calif. 91106**

**Filed Nov. 23, 1977, Ser. No. 854,259**

**Int. Cl.[2] H04N 9/54**

**U.S. Cl. 358—111** **30 Claims**




1. A stereoscopic fluoroscopy system comprising:

a source of radiation to radiate an object;

conversion means to receive radiated images reflective of said object from said source and to convert said images to a first electronic video signal and a second electronic video signal wherein each video signal is reflective of said object along respective lines of sight separated by a viewing angle;

transmission means conductively connected to said conversion means to receive and transmit said video signals; and

display means conductively connected to said transmission means to receive said video signals and generate optically viewable images reflective of said object, said display means including:

a television monitor conductively connected to receive said video signals and generate said optically viewable images,

synchronization detector means conductively connected to said transmission means to receive said video signals to detect video signal synchronization signal,

means conductively connected to said synchronization, detector means to transmit said synchronization signal,

a portable electro-optic shutter viewer having electro-optic shutters positionable proximate each eye of the viewer, means to receive said synchronization signal and means conductively connected thereto to alternatingly activate each electro-optic shutter in synchronization with said synchronization signal so that said viewer perceives a three-dimensional image.

---

**4,214,268**

**METHOD AND APPARATUS FOR VIDEO RECORDING A FILM SCAN SIGNAL**

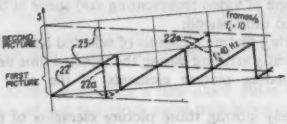
**Eduard Keznickl, and Kurt Boehm, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria**

**Filed Sep. 28, 1978, Ser. No. 946,777**

**Claims priority, application Switzerland, Oct. 3, 1977, 012042/77**

**Int. Cl.[2] H04N 5/76**

**U.S. Cl. 358—127** **12 Claims**




1. In a method for video recording of pictures from a moving picture film including the steps of continuously moving the

film relative to a recording screen, periodically scanning each of the pictures of the film, respectively, linewise, the moving picture frequency with respect to the scanning frequency being in a predetermined relationship with respect to each other for achieving a predetermined recording picture frequency, the improvement comprising the step of

maintaining the following relationship with respect to the scanning frequency ($f_A$) with different moving picture frequencies ($f_L$):

$$f_L + f_A = +F$$

wherein F is the desired predetermined recording picture frequency, and

said step of scanning comprises scanning fractions of a picture per scanning period, at least with one of the moving picture frequencies which is used, said fractions differing from 1 picture per scanning period.

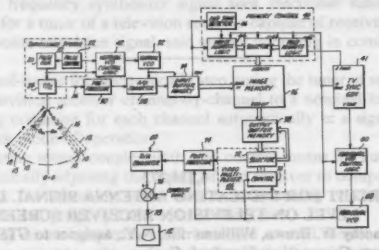
---

**4,214,269**

## REAL TIME DIGITAL SCAN CONVERTER

**Edward J. Parker, Seattle, and James C. Behlen, Jr., Redmond, both of Wash., assignors to Advanced Technology Laboratories, Inc., Bellevue, Wash.**

**Filed Mar. 9, 1979, Ser. No. 19,321**
**Int. Cl.[2] H04N 5/02**
**U.S. Cl. 358—140** **18 Claims**



7. A digital scan converter for supplying an analog signal representing signal information that is supplied by a scanning system of the type wherein said scanning system provides a sequence of discrete analog signals that are associated with a plurality of radially extending scan lines which are angularly spaced apart from one another and referenced to a polar coordinate system, said digital scan converter comprising:

signal sampling means connected for receiving said sequence of analog signals, said signal sampling means including means for digitizing each of said analog signals at a rate that is determined by the pulse repetition rate of an applied first clock signal to supply an ordered set of digitally encoded signals representative of each of said analog signals;

first signal generating means for supplying said first clock signal to said signal sampling means, said first signal generating means including means for supplying said first clock signal at a pulse repetition rate proportional to the cosine of the azimuthal angle of the scan line associated with the analog signal currently being supplied to said signal sampling means by said scanning system;

memory means connected for receiving said ordered sets of digitally encoded signals supplied by said signal sampling means, said memory means for storing values representative of each digitally encoded signal of said sequences of digitally encoded signals, said memory means being addressable to partition said memory means as a rectangular array of storage locations having a predetermined number of columns and a predetermined number of rows;

memory control means operably interconnected with said memory means and said signal sampling means for loading values corresponding to successive sets of digitally encoded signals into successive column locations of said rectangular array of storage locations with values corresponding to each particular ordered set of digitally encoded words being located into the successive row locations of a single column of said rectangular array of storage locations, said memory control means further including means for sequentially accessing said memory means on a row-by-row basis relative to said rectangular array of storage locations;

data means for reading the values stored as rows of said rectangular memory array to form a sequence of digitally encoded signals representative of each row of said stored values, said data means for reading said values being responsive to an applied second clock signal and including means for sequentially reading the values within a particular row of said rectangular memory array at a rate determined by the pulse repetition rate of said second clock signal;

second signal generating means for supplying said second clock signal, said second signal generating means including means for varying said pulse repetition rate of said second clock signal on a row-by-row basis relative to said memory array of said memory means to decrease said pulse repetition rate as each successive row of stored values is read from said memory means; and

digital-to-analog signal conversion means connected for receiving said sequence of digitally encoded signals representative of each of said rows of stored values, said digital-to-analog signal conversion means for supplying said analog output signal representative of said signal information.

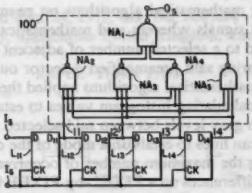
---

**4,214,270**

## DIGITAL VERTICAL SYNC SIGNAL SEPARATOR

**Hiroshi Morito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Feb. 10, 1978, Ser. No. 876,939**
**Claims priority, application Japan, Feb. 10, 1977, 52/14381**
**Int. Cl.[2] H04N 5/10; H03K 5/20**
**U.S. Cl. 358—154** **4 Claims**



1. A signal detector circuit comprising:

n stages of data latch circuits connected in series;

an input terminal coupled to a first stage of said data latch circuits for receiving an input signal;

means for applying clock pulses to said data latch circuits to shift a signal from said input terminal along said data latch circuits;

a plurality of first logic circuits each having n—m input ends and an output end and deriving an output in response to n—m inputs;

means for connecting the output ends of selected n—m ones of said data latch circuits to said n—m input ends of selected ones of said first logic circuits in such a manner that the output ends of different ones of said data latch circuits are combined with the input ends of different ones of said first logic circuits;

a second logic circuit having an input end connected to the output ends of said first logic circuits and an output end, and deriving an output in response to an input applied to said input end; and

an output terminal coupled to said output end of said second logic circuit,

said integer n is an integer of 3 to 6, and said input signal is a composite synchronizing signal in a television signal, said output signal derived from said output terminal corresponding to the vertical synchronizing pulses in said composite synchronizing signal.

---

**4,214,271**

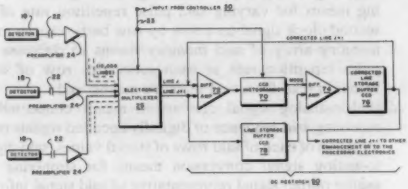
## TECHNIQUE FOR DC RESTORATION IN AC COUPLED DISPLAY SYSTEMS

**George R. Jones, Greenbelt, Md., and Peter K. Raimondi, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Continuation-in-part of Ser. No. 821,371, Aug. 3, 1977, abandoned. This application Feb. 16, 1979, Ser. No. 12,784**

**Int. Cl.² H04N 5/16, 5/33**

**U.S. Cl. 358—166** **6 Claims**



1. A technique for processing video detector signals in an AC coupled viewing system, the technique comprising:

scanning a scene input signal off a scanner mirror over a detector array for generating detector output corresponding to the intensity of said scene input signal therefrom that are applied through capacitors to a plurality of preamplifiers and for simultaneously picking off a transducer output signal from said scanner mirror for applying synchronizing clockpulse timer signals to a controller of said viewing system;

applying mathematical algorithms on peamplified detector output signals wherein said mathematical algorithms are applied to a selected number of adjacent scan lines;

DC restoring said preamplified detector output signals that have mathematical algorithms applied thereto by continuously calculating histogram values to establish the difference in gray levels between said selected number of adjacent scan lines to establish a mode of the difference representing the maximum number of occurrences of the gray level differences on a PIXEL-by-PIXEL basis between at least two of said selected number of adjacent scan lines and adding said mode of the difference to adjacent scan lines to maintain a predominant DC component of said scene input signal for producing DC restored signals on a line-to-line basis;

processing said DC restored signals into a visual image corresponding to the intensity of said scene input signal; and

displaying said visual image on a display device.

---

**4,214,272**

## VIDEO HIGHLIGHT ATTENUATION PROCESSOR

**John H. Hapgood, Daleville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 17, 1979, Ser. No. 30,789**

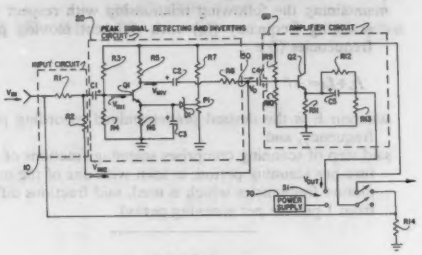
**Int. Cl.² H04N 5/197**

**U.S. Cl. 358—170** **4 Claims**

1. Anti-bloom apparatus for attenuating a video signal having peak portions produced by brightly lit areas in a scene being televised, the apparatus comprising:

a. input means for receiving the video signal and for deriving first and second signals corresponding to the video signal,

b. means for detecting and inverting the peak portions of said first signal having an amplitude greater than a predetermined maximum to produce an intermediate signal, and



c. means for combining said intermediate signal with said second signal such that an output signal is produced which corresponds to the video signal with the D.C. level of the peak portions attenuated.

---

**4,214,273**

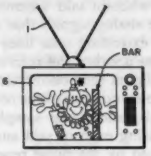
## CIRCUIT FOR INDICATING ANTENNA SIGNAL INPUT LEVEL ON TELEVISION RECEIVER SCREEN

**Timothy W. Brown, Williamsville, N.Y., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Mar. 19, 1979, Ser. No. 21,384**

**Int. Cl.² H04N 5/50**

**U.S. Cl. 358—188** **4 Claims**



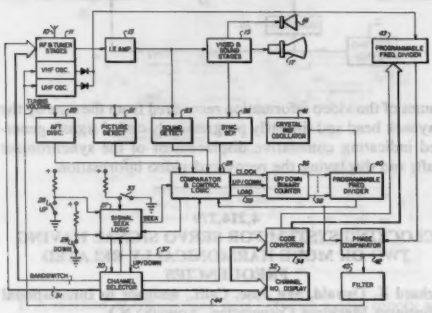

1. A television receiver circuit for indication on-screen of the optimum television antenna position and adjustment, said receiver including an RF tuner-amplifier, an IF amplifier stage, an AGC circuit providing an AGC signal to a gain control terminal on at least one of said tuner-amplifier and of said IF amplifier stage, a synchronizing pulse separator having a horizontal pulse output terminal and a vertical pulse output terminal, and a video channel having a modulating input terminal, said receiver circuit comprised of a first monostable multivibrator and with a triggering input coupled to one of said pulse output terminals of said separator, of a second monostable multivibrator with a variable-length-pulse input terminal coupled to said gain control terminal and with a triggering-input terminal coupled to the other of pulse output terminals said terminals of an AND circuit with inputs coupled to the outputs of said monostable multivibrators and with output coupled to said modulating input terminal.

## 4,214,274

## FREQUENCY SYNTHESIZER TUNING SYSTEM WITH VARIABLE DWELL SIGNAL SEEK

Theodore S. Rzeszewski, Lombard, and Paul D. Frantzis, Chicago, both of Ill., assignors to Matsushita Electric Corporation, Franklin Park, Ill.

Filed Jun. 19, 1978, Ser. No. 916,489
Int. Cl.² H04N 5/44
U.S. Cl. 358—193.1 6 Claims



1. A frequency synthesizer signal seek electronic tuning system for a tuner of a television receiver capable of receiving a composite television signal, said system including in combination:

control means for electronically step tuning the tuner of said television receiver channel-by-channel to a nominal tuning condition for each channel automatically in a signal seek mode of operation;

adjusting means coupled with said control means for automatically adjusting the tuning of said receiver to compensate for mistuning when said nominal tuning condition does not properly tune said receiver; and

timing means coupled with at least said control means and responsive to a change in channel selection by said control means to be set to a first predetermined timing period for channel-to-channel changes of a first type effected by said control means and to be set to a second predetermined timing period longer than said first predetermined timing period for channel-to-channel changes of a second type effected by said control means, the output of said timing means being coupled with said control means for causing said control means to step tune the tuner of the television receiver to the next channel in response to an output pulse produced by said timing means at the end of said predetermined timing periods.

## 4,214,275

## APPARATUS AND A PROCESS FOR READING A TARGET OF A CAMERA TUBE

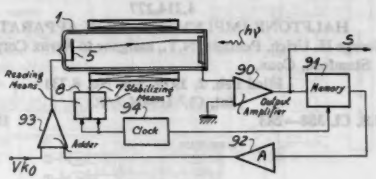
Pierre Felix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 5, 1978, Ser. No. 939,661
Claims priority, application France, Sep. 9, 1977, 77 27316
Int. Cl.² H04N 5/34
U.S. Cl. 358—223 10 Claims

1. A process for reading a target of a television camera tube with adjustable integration time by scanning the inner surface of the target in a plurality of parallel lines by an electron beam, wherein the reading of each line of order n successively comprises:

a stabilization phase along the line of order n of the potentials developed during an irradiation on the inner surface of the target in relation to its outer surface, said stabilization phase being effected by a scan along this line of order n by an electron beam which stabilizes the potentials along the line in question to a value Vo in relation to said outer surface, said stabilization phase being followed by:

the actual reading phase of the line of order n after a predetermined delay ti corresponding to the integration time ti of the target adjustable from $ti=k \cdot t_1$ to $ti=p \cdot t_1$, where k represents a mixed number smaller than 1, p represents an integer greater than or equal to 1, and where $t_1$ represents the scanning time of the line of order n, said reading phase being effected by scanning of the inner surface of the target along the line of order n by an electron beam which stabilizes the potentials of the inner surface of the target to



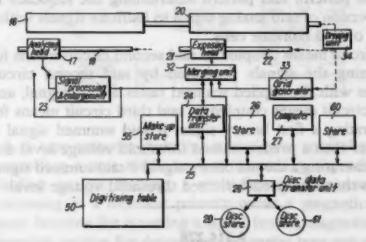
a value V'o in relation to the outer surface of the target, stabilization of the potentials to the value V'o generating a current representative of the video frequency image signal, wherein the stabilization potentials Vo and V'o of the inner surface of the target along the line of order n during the stabilization phase and during the actual reading phase have different values, the potential V'o being lower than Vo in absolute value, $|V'o| < |Vo|$, the video-frequency reading signal corresponding to a charge proportional to the radiation received during irradiation of the target over the integration time ti being reduced by a quantity proportional to $|Vo - V'o|$.

## 4,214,276

## PRINTING METHODS FOR PRODUCING PRINTS HAVING IMAGES OF VARIABLE SIZE AND TEXT

Peter C. Pugsley, Pinner, and Peter J. Wood, Potters Bar, both of England, assignors to Crosfield Electronics Limited, London, England

Filed Jun. 24, 1977, Ser. No. 809,684
Claims priority, application United Kingdom, Jun. 28, 1976, 26842/76
Int. Cl.² H04N 1/00
U.S. Cl. 358—256 6 Claims



1. A method of image reproduction for forming a whole-page image from a number of separate input images, comprising the steps of: scanning each of the input images and reproducing it at the required enlargement or reduction to produce a pre-print;

assembling all the pre-prints on a digitiser table in the relative positions required for the finished page;

placing a position-sensing device on the digitiser table at points defining the boundaries of the required picture portions to be reproduced, and generating corresponding

boundary-representing signals defining the positions of these points;

transferring the said boundary representing signals into a store;

under the control of the said boundary signals, deriving output signals including line signals for each of the input images crossed by the page line, within the limits defined by the said boundary representing signals for that input image; and

using the output signals to control the treatment of a sheet or surface for use in the preparation of a printed page.

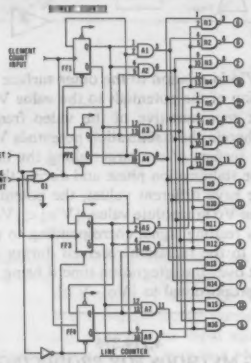
---

**4,214,277**

## HALFTONE IMPLEMENTATION APPARATUS

**George H. Urich, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Feb. 2, 1979, Ser. No. 8,731**
**Int. Cl.[2] H04N *1/40***
**U.S. Cl. 358—283** **10 Claims**



5. In an imaging system, apparatus for generating halftone signals in relation to an applied scanned raster analog signal comprising:

first circuit means for generating count signals representative of halftone cells comprising M×N picture elements, said halftone cells being repetitive throughout the entire image being scanned,

second circuit means coupled to said first circuit means for generating enabling signals in accordance with a predetermined pattern, said pattern determining the sequence of conversion of said analog signal to halftone signals within each of said halftone cells,

third circuit means coupled to said second circuit means for summing the signals generated by said second circuit means with the applied scanned raster analog signal, and

fourth circuit means coupled to said third circuit means for generating a first binary signal if said summed signal is greater than a predetermined threshold voltage level and for generating a second binary signal if said summed signal is less than said predetermined threshold voltage level.

---

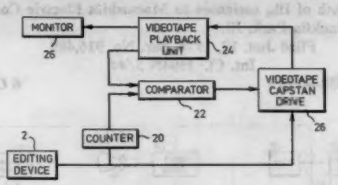
**4,214,278**

## EDITING SYSTEM FOR VIDEOTAPE SOUND

**Brian K. Hunt, Hamilton, and Leopold H. O'Donnell, Toronto, both of Canada, assignors to SCP Producer's Services Limited, Toronto, Canada**

**Filed Nov. 30, 1978, Ser. No. 964,903**
**Int. Cl.[2] G11B *27/02*; H04N *5/78***
**U.S. Cl. 360—14** **16 Claims**

1. A method of editing sound for videotape recordings comprising; slaving the movements of a videotape past a video playback head to the movements of a synchronizer shaft which synchronizes at least one sound film being edited, the slaving being accomplished by moving the videotape past the video head in such a direction and for such a distance as to establish parity between progressively coded signals associated with




frames of the video information recovered from the tape by the playback head and similarly progressively coded signals generated indicating cumulative displacement of the synchronizer shaft; and displaying the recovered video information.

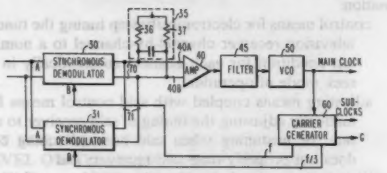
---

**4,214,279**

## CLOCKING SYSTEM FOR SERVO SIGNAL HAVING TWO OR MORE HARMONICALLY RELATED FREQUENCIES

**Richard K. Oswald, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 25, 1979, Ser. No. 6,403**
**Int. Cl.[2] G11B *5/09, 21/10***
**U.S. Cl. 360—51** **7 Claims**




1. A system for generating a clock signal from a source signal having at least two harmonically related and phase coherent frequencies, said clock signal having a frequency corresponding to a multiple of one of said two related frequencies and being phase locked to the lower of said two related frequencies, said system comprising:

(a) a voltage controlled oscillator (VCO) having a nominal frequency a multiple of said lower frequency and a control terminal for receiving a phase error signal to vary said nominal frequency, said phase error signal representing the instantaneous phase error between the output of said voltage controlled oscillator and said source signal relative to a predetermined lock point;

(b) means for generating said phase error signal comprising:

(1) first and second synchronous demodulators, each having a first input for receiving said source signal, a second input for receiving a carrier signal, and an output, each said synchronous demodulator generating a signal at its output representing the total energy contained in portions of said source signal supplied to said input, which portions are selected by the carrier signal supplied to said second input;

(2) means connected between the output of said VCO and said second inputs of said synchronous demodulators for generating first and second carrier signals at frequencies corresponding respectively to said two harmonically related frequencies of said source signal;

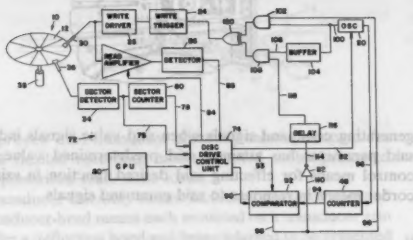
(3) and means connected between the outputs of said synchronous demodulators and the control input of said VCO to combine said output signals of said demodulators to provide said phase error signal.

4,214,280

## METHOD AND APPARATUS FOR RECORDING DATA WITHOUT RECORDING ON DEFECTIVE AREAS OF A DATA RECORDING MEDIUM

Martin O. Halfhill, San Jose, Calif., and James O. Jacques, Limerick, Pa., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1978, Ser. No. 911,006
Int. Cl.[2] G11B 5/09, 15/04
U.S. Cl. 360—53 12 Claims




1. A method of transferring data between a data supply and a disk file including a disk having a track divided into sectors, each sector having an address recording area followed by a data recording area, and one sector having a defective area, comprising the steps of:

(a) detecting the defective area on the data recording area to identify the defective area;

(b) writing an address of the defective area on the address recording area;

(c) recording data on the data recording area of the one sector including;

(i) continuously receiving data from the data supply for recording on the one sector,

(ii) detecting the defective area, with the address written on the address recording area;

(iii) writing a first part of the received data on the data recording area until the defective area is detected,

(iv) delaying writing the remaining part of the received data when the defective area is detected to avoid writing on the defective area, and

(v) subsequently writing the remaining part of the data on the data recording area succeeding the defective area; and

(d) continuously delivering the data written on the data recording area to the data supply, including:

(i) detecting the defective area with the address written on the address recording area;

(ii) reading the data written on the data recording area;

(iii) transferring with delay to the data supply the first part of the data read from the one sector between the beginning of the data recording area and the defective area until the defective area is detected; and

(iv) transferring without delay to the data supply the remaining data read from the one sector succeeding the defective area.

---

4,214,281

## TAPE RECORDER WITH MEANS FOR DISPLAYING OPERATION MODES IN THE FORM OF CHARACTERS

Masanobu Sato; Ken Satoh; Toshihiro Nakao, and Kenzi Furuta, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

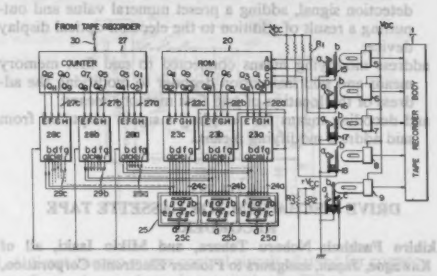
Filed Sep. 20, 1978, Ser. No. 944,003
Claims priority, application Japan, Sep. 30, 1977, 52-117558
Int. Cl.[2] G11B 5/09, 5/00
U.S. Cl. 360—61 4 Claims

1. A tape recorder with means for displaying operation modes in the form of characters comprising:

a tape recorder body;

a mode control switch group which is mounted on said tape recorder body and includes a plurality of operation mode control switches to control operation modes of the tape recorder, said operation modes being fast rewind, rewind, record, or play;

a display control switch group including a plurality of display control switches which are operated interlocking with said operation mode control switches;




a read only memory for producing first code signals corresponding to an operation mode control switch selectively operated;

a first decoder group for converting said first code signals into second code signals; and

display means including a plurality of segment display sections for displaying alphabetic characters corresponding to said second code signals.

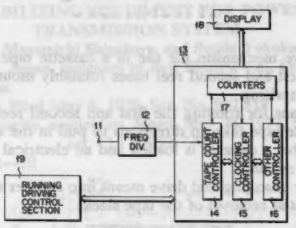
---

4,214,282

## TAPE RECORDER

Masanobu Sato, and Kenzi Furuta, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,461
Claims priority, application Japan, Feb. 13, 1978, 53/15242
Int. Cl.[2] G11B 15/18, 15/52, 19/06
U.S. Cl. 360—69 4 Claims




1. A tape recorder including a run/drive control section for controlling a tape mode such as recording, reproducing, rewinding or fast feeding, a multi-function logic section for processing at a different priority order a magnetic tape run count function for counting a signal from a magnetic tape run detection section for detecting a magnetic tape run and a time count processing function for counting a signal from the time count function section, and an electron-optical display device for displaying an output from the multi-function logic section, in which said multi-function logic section comprises:

first memory means for storing a microprogram for effecting a magnetic tape run process or a time count process based on said magnetic tape run detecting signal and predetermined data necessary for the process;

second memory means connected to said first memory means for defining a location by address data outputted through an address controller from said first memory

means, for effecting a read/write operation by an instruction signal outputted from said first memory means and for storing a time count pulse and said tape run detection signal;

calculating means connected to said second memory means for outputting data from a predetermined location of said second memory means, for calculating data from said predetermined location of said second memory means based on data which is outputted from said instruction decoder and for, when said data is a magnetic tape run detection signal, adding a preset numeral value and outputting a result of addition to the electron-optical display device;

address modifying means connected to said first memory means and said instruction decoder to modifying the address of the location of said first memory means;

and decoding means for decoding a signal outputted from said address modifying means.

---

**4,214,283**

## DRIVE MECHANISM FOR CASSETTE TAPE RECORDERS

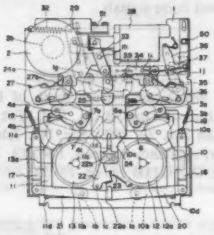
**Akihiro Fushimi; Noboru Tabara, and Mikio Isaki, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jan. 31, 1979, Ser. No. 8,286**

**Claims priority, application Japan, Jan. 31, 1978, 53-8789; Feb. 28, 1978, 53-21438**

**Int. Cl.[2] G11B** *15/43, 15/32, 5/54*

**U.S. Cl. 360—71** **34 Claims**



1. A drive mechanism for use in a cassette tape recorder including first and second reel bases rotatably mounted on a chassis, comprising

drive means for rotating the first and second reel bases in opposite tape take-up directions to pull in the slack of a tape after a cassette is loaded and an electrical power is turned on, and

means for changing said drive means into another state after substantial removal of the tape slack.

---

**4,214,284**

## METHOD AND APPARATUS FOR CONTROLLING TAPE RECORDER

**Thomas J. Mussatt, Riverton, Ill., assignor to Sangamo Weston, Inc., Atlanta, Ga.**

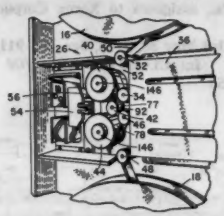
**Filed Apr. 17, 1978, Ser. No. 897,136**

**Claims priority, application United Kingdom, Apr. 18, 1977, 16063/77**

**Int. Cl.[2] G11B** *15/48*

**U.S. Cl. 360—72.1** **39 Claims**

1. In combination with tape recorder means including first and second reels, transducer means and transport means for transporting tape from one of said reels in predetermined relation with said transducer means onto the other of said reels, control apparatus comprising: signal entry means selectively operable for generating function signals representative of functions desired to be performed by said recorder means when a location parameter of said tape attains a predetermined value; sensing means associated with said recorder means for sensing said parameter and for generating value signals representative of the value of said parameter; data processor circuit means responsive to said function signals and said value signals for



generating command signals when said value signals indicate said parameter has attained said predetermined value; and control means for effecting said desired function in said recorder means in response to said command signals.

---

**4,214,285**

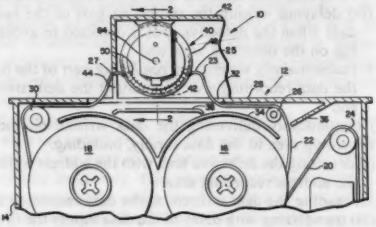
## SOUND MOTION PICTURE SYSTEM HAVING CONCENTRATED AUDIO SYSTEM

**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Apr. 25, 1978, Ser. No. 899,782**

**Int. Cl.[2] G11B** *5/008, 15/38, 15/66*

**U.S. Cl. 360—90** **9 Claims**

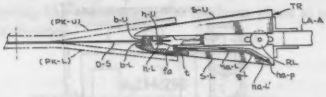


1. A tape drive and transducer system for recording of information on or providing playback from a recording tape, said system having drive means responsive to engagement with said tape for advancing said tape in a given direction, a transducer for facilitating recording or playback of audio information responsive to engagement with said tape during its said advancement therepast, and means for urging said tape into engagement with said drive means and said transducer, the improvement wherein said drive means and said transducer are combined in adjoining relation to one surface of said tape with their respective areas of engagement with said tape in a side-by-side arrangement generally lateral to said given direction and wherein said urging means includes means acting at least in part through said drive means for attracting said tape into engagement with said combined drive means and transducer and thereby concentrate the mass of said system at this point so as to reduce flutter in said recording or playback.

## 4,214,286
## FLEXIBLE DISK PACK AND IMPROVED TRANSDUCING-MANIPULATION THEREOF

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 711,628, Aug. 4, 1976. This application Oct. 2, 1978, Ser. No. 947,555
Int. Cl.² G11B 5/105
U.S. Cl. 360—99 14 Claims



1. Improved dual-transducer assembly means, adapted for use with flexible recording media adapted to be presented along a prescribed read/write locus;

the transducer assembly means including a pair of opposed transducer-head means each mounted on a transducer arm under a deflection hood and being adapted to be presented into transducing relation on opposite sides of a medium segment at a prescribed read/write site along said locus; and

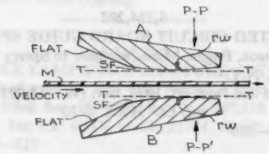
including, in combination therewith, the improvement comprising:

a pair of opposed stabilizer/cleaner means arranged so as to opposingly and resiliently engage the media, just upstream of the respective head means at said site, and along said locus, so as to stabilize the media and reduce flutter, as well as clean it, each stabilizer-cleaner means being disposed protectedly under its respective hood.

## 4,214,287
## NOVEL TSF HEAD PAIR FOR DUAL RECORDING ON FLEXIBLE DISKS

Roger R. Stromsta; Marshall R. Nathanson, both of Thousand Oaks, and Dennis S. Morton, Simi Valley, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 20, 1978, Ser. No. 926,429
Int. Cl.² G11B 5/60
U.S. Cl. 360—103 15 Claims

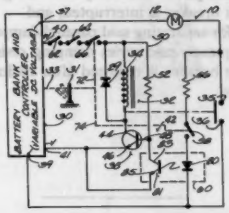


1. A recording arrangement comprising a pair of opposed recording means adapted to be translated relative to prescribed flexible media, while recording or detecting data indicia thereon, each recording means being disposed on one respective side of the intermediate medium and comprising improved air-bearing surface means that is adapted to be flown above said flexible media and at relatively close tolerances thereabove, this surface means being characterized by a pair of opposed edge surfaces, each surface comprising a relatively flat, tapered entry-segment and an adjacent "spherical-flat" working-segment, said working segments being relatively identically curved and accommodating transducer means, whereby low-velocity stability is enhanced and "head crash" is alleviated.

## 4,214,288
## DIRECT CURRENT MOTOR CONTROL WITH PROTECTIVE SOLENOID LATCHING

David T. Cavil, Menomonee Falls, Wis., and Gerald N. McAuliffe, Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 8, 1978, Ser. No. 967,611
Int. Cl.² H02P 3/00
U.S. Cl. 361—6 23 Claims

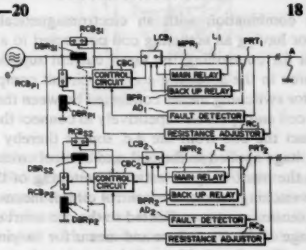


1. A direct current motor control circuit adapted for connection to first and second supply terminals of a DC power source and to a DC motor connected between positive and negative terminals of a DC power source, said control circuit comprising a solenoid including a solenoid coil connected between the first and second supply terminals, and having a pair of solenoid contacts connected in series relation with the DC motor between the positive and negative terminals and which close to energize the DC motor when current flows through said solenoid coil, semiconductor switching means having first and second terminals connected in series relation with said solenoid coil between the first and second supply terminals for controlling the current flow through said solenoid coil, and protective solenoid latching circuit means connected to said semiconductor switching means for controlling conduction of said switching means to selectively prevent current flow through said solenoid coil and closing of said solenoid contacts.

## 4,214,289
## STABILIZING EQUIPMENT FOR POWER TRANSMISSION SYSTEM

Kei Otsuka; Masamichi Shigehara, and Sumio Yokokawa, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 4, 1978, Ser. No. 902,919
Claims priority, application Japan, May 24, 1977, 52-60210
Int. Cl.² H02H 7/06
U.S. Cl. 361—20 18 Claims



1. A stabilizing equipment for a power transmission system having a power source system, at least one transmission line and at least one line circuit breaker inserted between said power source system and said transmission line for interrupting said transmission line when a fault occurs on said transmission line, said stabilizing equipment comprising:

a fault detector for detecting said fault,
a series damping resistor for connection in series with said line circuit breaker,
first means for inserting said series damping resistor between said power source system and said line circuit breaker before said line circuit breaker is interrupted and after said fault is detected by said fault detector,
a parallel damping resistor,
second means for inserting said parallel damping resistor between said power source system and ground after said line circuit breaker is interrupted, and
third means for separating said parallel damping resistor first and subsequently said series damping resistor before said line circuit breaker is reclosed after reclosing conditions are satisfied.

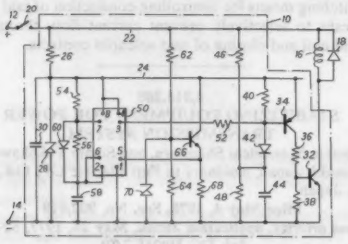
---

4,214,290

## CONTROL CIRCUIT FOR ELECTROMAGNETICALLY OPERATED CONTACTOR

Albert E. Sloan, Gateshead, England, assignor to Sevcon Limited, Gateshead, England

Filed Mar. 18, 1977, Ser. No. 778,857
Claims priority, application United Kingdom, Mar. 19, 1976, 11219/76
Int. Cl.[2] H01F 7/18
U.S. Cl. 361—154 6 Claims



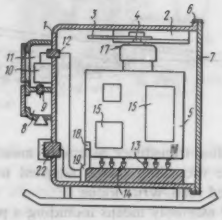
1. In combination with an electromagnetically operated contactor having an actuating coil connected to a d.c. source, a circuit for controlling the mean current supplied from the d.c. source to the actuating coil, the circuit comprising semiconductor switching means connected between the d.c. source and the coil and operable repetitively to connect the coil to and disconnect the coil from the d.c. source thereby to vary the mean voltage applied to the coil, and control circuit means for varying the mark-to-space ratio of switching of the semiconductor switching means, the control circuit means comprising voltage sensing means connected to the d.c. source for sensing the voltage of the d.c. source and means for varying the mark-to-space ratio of switching of the semiconductor switching means in dependence only on the magnitude of the sensed voltage, said means reducing said mark-to-space ratio on increase of said sensed voltage, whereby the mean voltage applied to the coil is maintained substantially constant so that the mean current in the coil on energization of the contactor is held at a predetermined level at least equal to the holding current of the coil substantially independent of the magnitude of the source voltage over a range of d.c. source voltages.

4,214,291

## EXPLOSION-PROOF SWITCHGEAR APPARATUS

Vitaly I. Koshman, bulvar Shevchenko, 123, kv. 25, Donetsk; Mikhail A. Nagorny, ulitsa Sotsialisticheskaya, 146, kv. 2, Makeevka, Donetskaya oblast, and Vladimir F. Petrichenko, ulitsa Prozhektornaya, 6, kv. 44, Donetsk, all of U.S.S.R.

Filed Dec. 27, 1978, Ser. No. 973,564
Claims priority, application U.S.S.R., Jan. 10, 1978, 2569051
Int. Cl.[2] H02B 11/22
U.S. Cl. 361—338 2 Claims



1. An explosion-proof switchgear apparatus comprising:
an enclosure with a guide;
a carriage mounted within the enclosure for travel along said guide;
a pivot pin whereon said carriage is mounted;
a separable contact system including: a movable part and a fixed part, said fixed part of said separable contact system being mounted within said enclosure on the side opposite to said guide;
electric devices;
a chassis to accommodate said electric devices, having a vertical slot;
said movable part of said separable contact system, mounted on said chassis at the side thereof whereon said vertical slot is located;
a guiding retainer means received into said vertical slot of said chassis;
said guiding retainer means secured to the same side of said enclosure, whereon said fixed part of said separable contact system is arranged; and
a coupling unit mounted on said pivot pin and secured to said chassis in the side thereof which is reverse to the side whereon said vertical slot is located.

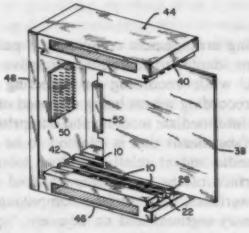
---

4,214,292

## PRINTED CIRCUIT BOARD GUIDE SPRING

Gary R. Johnson, Eagan, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 964,991
Int. Cl.[2] H05K 7/20
U.S. Cl. 361—386 4 Claims



1. A guide spring, comprising:
a rectangular planar base member;

a plurality of spring-like members formed integrally with said base member along one side thereof and at a right angle thereto in a like first direction therefrom;

first and second flange members formed integrally with said base member along the opposite ends thereof and at a right angle thereto in a like second direction, opposite to said first direction, therefrom;

said first and second flange members having first and second tab members, respectively, formed integrally therewith in an opposing direction, and extending generally toward each other; and,

a third flange member formed integrally with an end one of said spring-like members and in the same plane as said first flange member.

---

**4,214,293**

## ELECTROLYTIC CAPACITORS

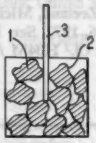
**Henley F. Sterling, Great Dunmow; Eric L. Bush, Matching Green, Near Harlow, and Stephen J. McManus, Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.**

**Continuation of Ser. No. 787,672, Apr. 14, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 14,008**

**Claims priority, application United Kingdom, May 20, 1976, 20879/76**

**Int. Cl.² H01G 9/00**

**U.S. Cl. 361—433** **27 Claims**




1. An anode for an electrolytic capacitor comprising:

a core material consisting essentially of particles of an electrically insulating substance having a first degree of hardness; and

a coating of valve metal, having a second degree of less than said first degree of hardness, on the core material wherein the coated core material is pressure compacted into a porous coherent anode body without sintering and the degree of porosity is partially controlled by the thickness of the valve metal coating.

---

**4,214,294**

## ADJUSTABLE LAMP FOR FURNITURE ATTACHMENT

**Charles C. Bartlett, P.O. Box 489, Waterloo, N.Y. 13165**

**Filed Sep. 29, 1978, Ser. No. 947,210**

**Int. Cl.² F21V 33/00, 21/14, 21/22**

**U.S. Cl. 362—127** **8 Claims**

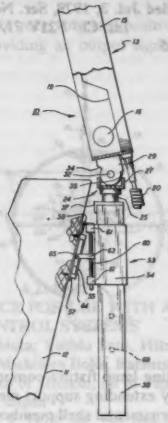
1. A lamp for attachment to a piece of furniture including an electrical source of illumination mounted within a shade,

a support standard mounted by a pivot to said shade whereby the angular position of the shade in reference to the axis of the standard is adjustable,

an elongated housing enclosing said standard having at least one friction bushing secured therein for engaging the standard in friction supporting contact whereby the standard can be moved axially within the housing and also rotated about its axis within said bushing,

a mounting fixture having a base securable to a piece of furniture and a frame rotatably mounted on the base by means of a horizontal hinge, said frame arranged to slidably receive said housing therein, and a locking means for securing the housing within the frame at a predetermined position, and

an adjustable bracket acting between the base and the frame being operable to change the angular relationship therebetween whereby the frame may be moved to a vertical position when the base is affixed to an inclined surface.



---

**4,214,295**

## PORTABLE ELECTRIC LAMP ADJUSTABLE FROM SPOT BEAM TO DIFFUSED BEAM

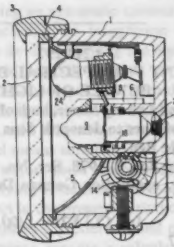
**Harold Morton, Audenshaw, England, assignor to Oldham Batteries Limited, Manchester, England**

**Contiauation-in-part of Ser. No. 744,850, Nov. 24, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,424**

**Claims priority, application United Kingdom, Dec. 22, 1975, 52384/77**

**Int. Cl.² F21L 23/00**

**U.S. Cl. 362—164** **6 Claims**



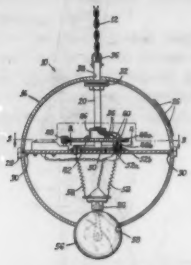
1. A portable electric lamp comprising:

a body including a lens, a lens holder, a reflector, and a bulb holder connectable through switching means with a source of electric power, a diffuser sleeve translucent to light co-axial with and surrounding the bulb holder, and drive means operatively engaged with the diffuser sleeve for effecting the axial movement thereof relative to the bulb holder between a retracted position at which light emanating from a bulb held in the bulb holder is focused into a spot beam by the reflector, and an extended position at which light emanating from the bulb is diffused or scattered by passage through said diffuser sleeve without reducing the overall intensity of the light passing through the lens.

## 4,214,296
## ROTATABLE LAMP FIXTURE

Fred M. Magett, 33 W. 83rd St., Chicago, Ill. 60620

Filed Jul. 3, 1978, Ser. No. 921,270
Int. Cl.[2] F21V *21/30*
U.S. Cl. 362—35 15 Claims



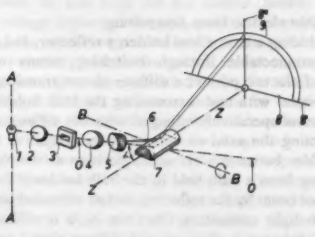
1. A self rotating lamp fixture comprising:
(a) a vertically extending support member;
(b) a hollow ornamental shell member rotatably mounted on said support member, said support member being disposed substantially within said shell member;
(c) means associated with said support member for rotatably supporting said shell member said associated means being constructed and arranged so that the entire shell member is adapted to rotate about said support member;
(d) a motor disposed within said shell member for rotating said shell member about said support member;
(e) motor support means disposed within said shell member for supporting said motor;
(f) drive means interconnecting said motor and said vertically extending support member;
(g) electrical circuitry including electrical wiring adapted to be connected to a source of electrical power and extending into said shell member and connected to provide a current path to said motor;
(h) said motor being effective when energized to rotate said shell member about said vertically extending support member.

---

## 4,214,297
## ARRANGEMENT FOR SPECTRAL DISPERSION OF A BUNDLE OF LIGHT

Gebhard Kühn, and Ludwig Meier, both of Jena, German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Feb. 7, 1978, Ser. No. 878,609
Claims priority, application German Democratic Rep., Mar. 29, 1977, 198110
Int. Cl.[2] F21V *5/00*
U.S. Cl. 362—327 1 Claim



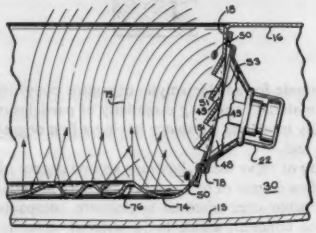
1. An arrangement for spectral dispersion of a bundle of light, particularly for producing artificial rainbows in planetaria, comprising
a light source for producing a directed bundle of light,
a condensor lens,
an aperture,
said light source and said condensor lens illuminating said aperture,
an imaging system,
a prism,
said imaging system being for imaging said aperture upon said prism, said prism spectrally dispersing said bundle of light,
and a cylindrical reflector having a cylinder axis and being tiltable about a first axis substantially at right angles to said cylinder axis,
said light source, said condenser lens,
said imaging system, said prism and said cylindrical reflector being arranged in optical alignment about a common optical axis and being tiltable about said first axis and about a second axis,
said second axis being substantially at right angles to that plane being defined by said cylinder axis and said first axis.

---

## 4,214,298
## COMBINATION ACOUSTIC CONDITIONER AND LIGHT FIXTURE

Robert L. Propst, Ann Arbor; Travis M. Randolph, and Theodore M. Reyda, both of Saugatuck, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Dec. 6, 1977, Ser. No. 857,894
Int. Cl.[2] H04M *1/22*
U.S. Cl. 362—253 8 Claims



1. In a light fixture assembly which includes a support, a light reflecting element mounted on said support and a light source mounted on said support for directing light against said reflecting element, a sound emitter mounted on said support at a position to direct sound waves against said reflecting element, said reflecting element having non-uniformly shaped undulating surfaces for disseminating incident light and sound waves in a plurality of directions to produce substantially indistinct and unintelligible sounds for masking external sounds in the vicinity of said light fixture assembly and to diffuse the light from said light source.

---

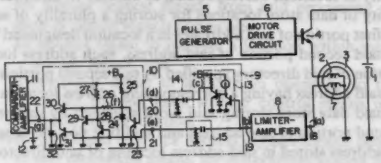
## 4,214,299
## FREQUENCY-VOLTAGE CONVERTER

Harushige Nakagaki; Syunji Iwasaki, both of Toyokawa, and Isao Fukushima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1978, Ser. No. 940,007
Claims priority, application Japan, Sep. 9, 1977, 52-107797
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—8 5 Claims

1. A frequency-voltage converter for converting a frequency to a DC voltage by use of a first pulse train having repetition pulses proportional to the frequency of an input

signal and a second pulse train having repetition pulses obtained by shifting the pulses of said first pulse train in timing phase, said frequency-voltage converter comprising; a saw-tooth wave voltage generator circuit driven by said second




pulse train for generating repetition saw-tooth wave signal, and a sample-and-hold circuit connected to said saw-tooth wave generator circuit and driven by said first pulse train for sampling and holding each pulse of said saw-tooth wave voltage, thereby producing a DC voltage.

---

**4,214,300**

## THREE TERM (PID) CONTROLLERS

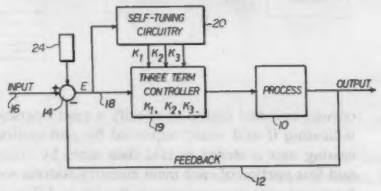
**Paul Barlow, Liverpool, England, and Kenneth R. Jones, 99 Stairhaven Rd., Liverpool, L19 7NW, Merseyside, England, assignors to Kenneth Robert Jones, Liverpool, England**

**Filed May 15, 1978, Ser. No. 906,253**

**Claims priority, application United Kingdom, May 17, 1977, 20597/77**

**Int. Cl.[2] G06G *7/66*; G05B *11/42, 13/00***

**U.S. Cl. 364—105** **12 Claims**




1. An electronic circuit for adjusting a variable parameter of a dynamic system in response to a signal representative of the system performance so as to optimize the system performance with respect to that parameter, the circuit comprising:

(a) means for extracting from the dynamic system a first signal dependent upon the system performance;

(b) a plurality of performance index blocks coupled to said means for extracting so as to receive said first signal each of said blocks for providing a different predetermined characteristic function of said first signal;

(c) switch means coupling said means for extracting to said plurality of performance index blocks for selecting one of said performance index blocks;

(d) means coupled to said performance blocks for periodically sampling and comparing the output level from a selected performance index block with a previously sampled level and for providing a difference signal indicative of whether the result of said comparison is positive or negative;

(e) means coupled to said means for sampling and comparing for providing a first pulsed signal wherein pulses and zero levels are respectively indicative of the incidence of opposite polarity levels in said difference signal;

(f) means coupled to said means for providing a first pulsed signal for converting said first pulsed signal into a second pulsed signal wherein the leading and trailing edges of the pulses correspond to the incidence of adjacent pulses in said first pulsed signal;

(g) means for shifting the zero axis position in relation to said second pulsed signal to obtain positive and negative signals whose width is indicative of the extent to which the parameter to be varied must be increased or decreased; and

(h) integrator means for receiving said positive and negative signals and for providing an output signal for adjusting said parameter.

---

**4,214,301**

## DIAGNOSTIC DEVICE FOR USE WITH AUTOMATIC CONTROL SYSTEMS

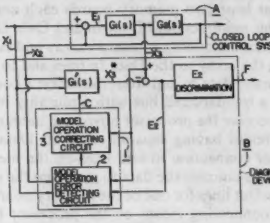
**Nobuo Kurihara, Hitachiota; Yoshio Sato, Hitachi; Shigeyoshi Kawano, Hitachiota; Michihiro Iioka, Katsuta; Daizo Iba, and Tadashi Kurihara, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 7, 1978, Ser. No. 884,235**

**Claims priority, application Japan, Mar. 8, 1977, 52-24383**

**Int. Cl.[2] G05B *17/00, 13/02*; G06F *15/46***

**U.S. Cl. 364—119** **3 Claims**




1. A diagnostic device for use with an object to be diagnosed, said object having an automatic control system forming a closed loop and including an integration element in said object, said diagnostic device sampling the input and output of said object with a fixed periodic time so as to obtain digital signals, and detecting an abnormal state of said object in accordance with said digital signals so as to indicate the occurrence of the abnormal state, said diagnostic device comprising:

mathematical model means simulating an input-output characteristic of said object to be diagnosed;

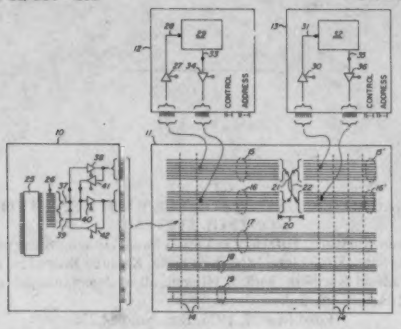
first means for applying to said model means said sampled input of said object in the present period of time when said object output satisfies a predetermined condition for letting the model means execute a calculation to obtain an output of said model means corresponding to the output of said object, and for letting the model means output coincide with the object output in the present period of time without executing the model means calculation when said object output does not satisfy said predetermined condition, said predetermined condition being that a rate of change of said object output is larger than a predetermined value, so that accumulation of errors in the model means calculation when the predetermined condition is not satisfied is avoided; and

second means for comparing the output of said model means controlled by said first means with the output of said object in the present period of time, and then for detecting an abnormal state of said object in accordance with a deviation output obtained by the comparison so as to indicate the occurrence of the abnormal state.

## 4,214,302
## EIGHT BIT STANDARD CONNECTOR BUS FOR SIXTEEN BIT MICROCOMPUTER

Robert W. Schmidt, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 24, 1978, Ser. No. 898,736
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 6 Claims



1. A microcomputer comprising: a processor board containing a microprocessor having sixteen-bit bidirectional data terminals; at least two memory boards each containing separate eight-bit unidirectional Data In and Data Out lines, each memory board containing a memory array and coupling means connecting the array to the Data In lines and to the Data Out lines to transfer data to and from the array; a connector board containing a standardized bus with a plurality of plug-in connectors to receive the processor board and memory boards, the connector board having separate eight-bit Data In and Data Out lines for connection to said lines on the memory boards; means to cross-connect the data to and from the eight-bit Data In and Data Out lines for one of the memory boards but not the other; and connecting means on the processor board to connect the sixteen-bit bidirectional data terminals to the two separate eight-bit Data In and Data Out lines of the connector board, said microprocessor including means for simultaneously transmitting or simultaneously receiving sixteen bits to or from said memory arrays by utilizing said Data In and Data Out lines as a sixteen-bit bidirectional bus.

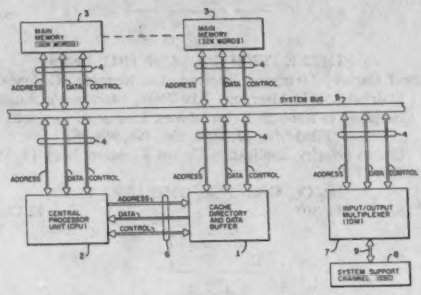
---

## 4,214,303
## WORD ORIENTED HIGH SPEED BUFFER MEMORY SYSTEM CONNECTED TO A SYSTEM BUS

Thomas F. Joyce, Burlington; Thomas O. Holtey, Newton Lower Falls, and William Panepinto, Jr., Tewksbury, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,093
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 11 Claims

1. A data processing system comprising:
a system bus;
a central processing unit coupled to said bus and being operative to generate memory requests, each memory request including a main memory address;
an addressable main memory coupled to said bus, said main memory including a plurality of sets of locations for storing a plurality of words, each word location being designated by an address coded to include a first portion and a second portion; and,
a cache unit coupled to said bus and to said central processing unit, said cache unit comprising:
a register for storing said main memory address received from said central processing unit;
an addressable data store, said data store having a plurality of locations for storing the contents of subsets of said sets of locations for storing said plurality of words, each word location being designated by said second portion of said address;
an addressable directory, said directory including a plurality of locations corresponding in number to said plurality of data store locations for storing a plurality of said first portion of said addresses in a location designated by said second portion of said address, each address location of said directory specified by said second portion of said address having a corresponding address location in said data store storing said word specified by said second portion of said address and said first portion of said address stored in said address location of said directory specified by said second portion of said address, said cache unit and said directory receiving said main memory address from said central processing unit when requesting said word from said main memory; and,
control means coupled to said register and responsive to each memory request received from said central processing unit and coded to specify a read operation for indicating if said word requested by said central processing unit is stored in said data store by comparing said first portion of each main memory address received from said central processing unit with said first portion address stored in the location of said directory read out in response to said second portion of each main memory address received from said central processing unit, and in the absence of said equal comparison requesting said word from said main memory by generating a signal for transferring signals representative of said main memory address to said register and to said main memory, said control means being operative upon receiving said word from main memory to generate signals for writing said word in said data store at the location designated by said second portion of said address stored in said register and for concurrently writing said first portion of said main memory address stored in said register in said directory in said location designated by said second portion of said main memory address.



---

## 4,214,304
## MULTIPROGRAMMED DATA PROCESSING SYSTEM WITH IMPROVED INTERLOCK CONTROL

Tsuguo Shimizu, and Tsuguo Matsuura, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,215
Claims priority, application Japan, Oct. 28, 1977, 52-128703
Int. Cl.[2] G06F *13/00, 15/16*
U.S. Cl. 364—200 16 Claims

1. In a multiprogrammed data processing system comprising:
means for processing data;
main storage means for storing data; and
main storage control means, connected to said processing

means and said main storage means, for controlling the transfer of request signals and data therebetween;

the improvement wherein said main storage control means includes:

request register means, connected to said processing means, for storing request signals from said processing means, each of which signals comprises

an address signal to indicate a location within said main storage means, and

a command signal to indicate an operation to be performed by said main storage control means on data stored in said location;

first and second interlock address register means, connected to said processing means, for respectively storing first and second parts of an interlocked address within said main storage means as first and second interlock addresses, respectively;

first comparing means, connected to said processing means and said first interlock address register means, for determining coincidence between said first interlock address and a corresponding first part of an address of each succeeding request signal provided by said processing means to be performed;

second comparing means, connected to said second interlock address register means and said processing means, for determining coincidence between said second interlock address and a corresponding second part of said address of said each succeeding request signal provided by said processing means; and

transfer means, connected to said processing means, for simultaneously supplying each succeeding request signal from said processing means to said first comparing means and said request register means; and

control means, connected to said request register means and said first and second comparing means, for transferring each succeeding request signal stored in said request register means to said main storage means in response to a non-coincidence signal provided by either of said first or second comparing means.

---

**4,214,305**

## MULTI-PROCESSOR DATA PROCESSING SYSTEM

**Yoshiaki Tokita, and Keisuke Okajima, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan**

**Filed Jun. 20, 1978, Ser. No. 917,373**

**Claims priority, application Japan, Jun. 20, 1977, 52-72075**

**Int. Cl.[2] G06F *13/00***

**U.S. Cl. 364—200** **5 Claims**

1. A stored program control type multiprocessor data processing system including a main memory unit having programs and data stored therein and a write-in bus and a read-out bus by which processors are connected to the main memory unit, said system comprising:

(1) a bus arbiter;

(2) a plurality of processors; and

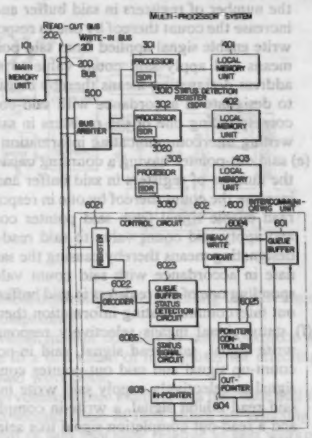
(3) an intercommunicating unit;

(1) said bus arbiter being connected between said processors and said write-in and read-out buses and comprising:

(a) preference selection means for preferentially selecting any one of said processors according to a predetermined sequence when a bus request is made by every one of said processors simultaneously, and

(b) means for connecting one of said processors selected by said preference selection circuit to said buses selectively,

(2) said plurality of processors being disposed to be connected to said buses selectively and commonly through said bus arbiter, said processors being adapted so that when a particular process is executed by a selected one of said processors, said selected processor writes information relating to said particular process in said main memory unit and executes an intercommunicating information write-in instruction so that after execution of said particular process a first address of a storage area of said main memory unit having said information stored therein is supplied to said write-in bus as an intercommunicating information corresponding to said particular process or a successive process of another of said processors, said selected processor, when idle, executing an intercommunicating information readout instruction to execute a process corresponding to an intercommunicating information read out,




(3) said intercommunicating unit comprising:

(i) a queue buffer including:

(a) a buffer comprising a plurality of registers and adapted to store intercommunicating information in a first-in first-out manner.

(b) write-in address designating means for designating one of said registers in said buffer for writing intercommunicating information thereinto, and

(c) read-out address designating means for designating one of said registers in said buffer for reading out intercommunicating information therefrom,

(ii) control means including:

(a) means disposed to receive an operation code and intercommunicating information from said write-in bus to discriminate one or the other of a write signal and a read signal in accordance with said operation code,

(b) queue buffer status detecting means disposed to receive an input value to said write-in address designating means and an input value to said read-out address designating means for comparing the same, whereby upon reception of said write signal from discriminating means, when the presence of one or a

predetermined number of registers in which intercommunicating information is unwritten in said buffer is identified as a result of the comparison a write enable signal is generated, and when the absence of such unwritten registers is identified a write inhibit signal is generated, while upon reception of said read signal from said discriminating means, when the presence of at least one register in which intercommunicating information is written in said buffer is identified as a result of said comparison a read enable signal is generated, and when the absence of such written register is identified a read inhibit signal is generated,

(c) pointer control means disposed to selectively receive the write enable signal and the read enable signal from said queue buffer status detecting means to delay the same by at least a time sufficient to complete an operation of writing intercommunicating information into said queue buffer, and an operation of reading out intercommunicating information from said queue buffer and transmitting it to said read-out bus, respectively, and then applying it selectively to an in-pointer and out-pointer to thereby cause the same to count up,

(d) said in-pointer having a counting capacity equal to the number of registers in said buffer and adapted to increase the count thereof by one in response to every write enable signal applied from said pointer control means and apply said count value to said write-in address designating means thereby causing the same to designate in accordance with said count value, a corresponding one of the registers in said buffer for writing intercommunicating information thereinto,

(e) said out-pointer having a counting capacity equal to the number of registers in said buffer and adapted to increase the count thereof by one in response to every read enable signal from said pointer control means and apply said count value to said read-out address designating means thereby causing the same to designate in accordance with said count value, a corresponding one of the registers in said buffer for reading out intercommunicating information therefrom,

(f) status signal means selectively responsive to said write signal, said read signal, said in-pointer count count-up signal and said out-pointer count count-up signal to selectively supply said write inhibit signal, said read inhibit signal, a write-in completion signal and a read-out completion signal to a selected one of said processors through said read-out bus, and

(g) read/write control means responsive to said write enable signal to receive intercommunicating information from said discriminating means in said control means and supply the same to said queue buffer and responsive to said read enable signal to read out intercommunicating information from said queue buffer and supply the same to said read-out bus.

---

**4,214,306**

## ELECTRONIC FUEL INJECTION CONTROL APPARATUS

**Akio Kobayashi, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan**

**Filed May 17, 1978, Ser. No. 907,054**

**Claims priority, application Japan, May 31, 1977, 52-64068**

**Int. Cl.**[2] **F02D** *5/00;* **G06F** *15/20*

**U.S. Cl. 364—431** **5 Claims**

1. An electronic fuel injection control system for an automotive vehicle driven by an internal combustion engine having an output shaft, said system being operative to reduce the resonance of said vehicle and comprising:

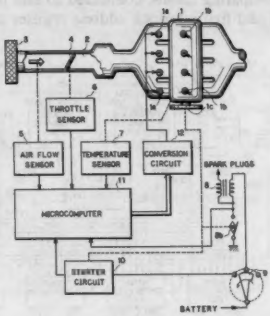
means for generating at every rotation of said output shaft an intake signal related to an intake parameter of said engine;

means for generating at every rotation of said output shaft a speed signal related to the rotational velocity of said output shaft;

controlling means responsive to said intake signal means and said speed signal means for generating an output signal related to the amount of fuel to be injected in said engine, said controlling means including:

means for monitoring the existence of operating conditions in said engine conducive to the amplification of resonance in said vehicle upon changes in the output torque of said engine,

means responsive to said monitoring means for generating a control signal proportional to said speed during the absence of said conductive operating conditions and related to a modified speed signal during the presence of said conducive operating conditions, said modified speed signal being respectively smaller and greater than




said speed signal as said speed signal increases and decreases, said modified speed signal thus being delayed with respect to said speed signal so that changes in said control signal are delayed during periods of said conducive operating conditions, and

means for generating said output signal proportional to said intake signal and inversely proportional to said control signal at every rotation of said output shaft, changes in said output signal being thereby delayed during periods of said conducive operating conditions to avoid amplification of resonance in said vehicle upon changes in the output torque of said engine, thereby improving the smoothness of operation of said engine; and

means responsive to the output signal of said controlling means for controlling the amount of fuel injected in said engine at every rotation of said output shaft.

---

**4,214,307**

## DECELERATION LEAN OUT FEATURE FOR ELECTRONIC FUEL MANAGEMENT SYSTEMS

**William A. Peterson, Jr., Rochester, and Roman O. Marchak, Northville, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Jun. 22, 1978, Ser. No. 918,307**

**Int. Cl.**[2] **G06F** *15/46;* **F02M** *7/00, 51/00*

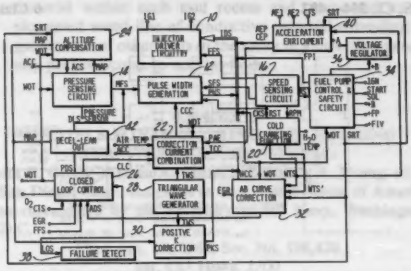
**U.S. Cl. 364—431** **10 Claims**

1. An electronic control unit for the management of the air/fuel ratio of an internal combustion engine with an exhaust gas recirculation (EGR) valve, said electronic control unit comprising:

base calibration means for regulating the air/fuel ratio of the engine in response to sensed engine operating parameters indicative of one of the mass air flow and mass fuel flow inducted into the engine, said base calibration means regulating the air/fuel ratio by sensing one of said mass air flow and said mass fuel flow and calculating the other

from a predetermined schedule of desired air/fuel ratios; and

lean out means for increasing the air/fuel ratio of said internal combustion engine during decelerations, said lean out means preventing increased emissions during decelerations because of EGR valve response delay; wherein said lean out means comprises means for sensing a deceleration and for generating a deceleration signal indicating that the



engine is experiencing a deceleration greater than a predetermined amount indicative of EGR valve response delay; and

means responsive to said deceleration signal for increasing said air/fuel ratio when the deceleration of the engine increases beyond said predetermined amount, said means for increasing said air/fuel ratio connected to said base calibration means and operable to change said scheduled air/fuel ratio.

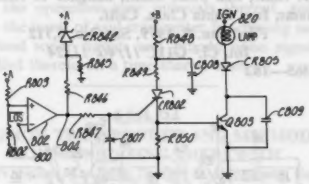
---

**4,214,308**

## CLOSED LOOP SENSOR CONDITION DETECTOR

**Ralph W. Carp, Newport News, Va., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jun. 22, 1978, Ser. No. 918,308**
**Int. Cl.[2] G06F *15/46*; F02M *7/00, 51/00***
**U.S. Cl. 364—431** **9 Claims**



1. A latched indicator circuit for providing a visual indication of a sensed failure condition of a closed loop electronic control unit having an exhaust gas sensor, which visual indication is electronically nonresetable once the condition has occurred, said indicator circuit comprising:

condition indication means for generating a condition signal indicative of the occurrence of the failure condition;

latching means for generating an indicator signal when energized, said latching means having a control electrode receiving said condition signal and operable to energize said latching means upon receipt of the condition signal, wherein said latching means will remain energized until mechanically disconnected from a power supply which substantially remains on at all times; said latching means including an SCR device with its anode and cathode terminals connected in series with said power supply and a reference potential, wherein the gate terminal of the SCR is said control electrode, and the presence of said condition signal produces latched conduction in said SCR to provide said indication signal representative of the energization of the latching means; and impedance means further connected in series with said SCR between said power supply and reference for limiting the amount of current drawn through said SCR during its latched state and for generating a control voltage dependent upon said limited current which is said indication signal, said impedance means thereby limiting the power dissipation of the indicator circuit during latched time periods; and

indicator means responsive to said indicator signal for generating a visual indication of the energization state of said latching means and the occurrence of the failure condition; said indicator means energized with a second power supply which is turned off when said electronic control unit is not on.

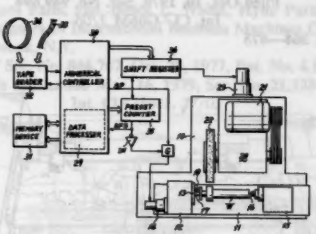
---

**4,214,309**

## NUMERICAL CONTROLLER FOR CONTROLLING MACHINING OF OVAL WORKPIECE

**Tsuyoshi Koide, Toyota, and Yasuji Oda, Kariya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan**

**Filed Oct. 31, 1978, Ser. No. 956,231**
**Claims priority, application Japan, Nov. 8, 1977, 52/134452**
**Int. Cl.[2] B23B *1/00***
**U.S. Cl. 364—474** **5 Claims**



1. A numerical controller for controlling the machining of a workpiece comprising:

a first servomechanism coupled to said workpiece and responsive to a first chain of feed pulses for effecting rotation of said workpiece;

a second servomechanism coupled to a tool slide and responsive to a second chain of feed pulses for effecting a feed movement of said tool slide relative to said workpiece;

data processing means coupled to said first and second servomechanisms for producing said first and second chains of feed pulses in accordance with a profiling program so as to machine said workpiece to a predetermined oval form in accordance with said profiling program, said data processing means comprising,

memory means for storing said profiling program composed of a series of data blocks,

data read-out means for reading out a successive one of said data block from said memory means,

interpolation processing means for processing profiling data included in said successive one of said data blocks read out from said memory means so as to provide interpolation data in the form of said first and second chains of feed pulses, said second chain of feed pulses to be distributed in connection with said first chain of feed pulses,

pulse distribution means for applying said first and second chains of said feed pulses respectively to said first and second servomechanisms, respectively,

means for ascertaining whether or not said workpiece is in a rough machining operation or in a fine machine operation,

read-out control means for controlling said read-out means to successive read out a predetermined number of data blocks of said series of said data blocks when it is ascer-

tained that said workpiece is in said rough machining operation,

data accumulating means for accumulating profiling data included in said predetermined number of said data blocks, and

interpolation control means for controlling said interpolation processing means to provide said interpolation data based upon the accumulated profiling data accumulated by said data accumulating means;

wherein the number of said predetermined number of data blocks is predetermined such that the amount of time spent by said interpolation processing means during reading and processing of the profiling data included in said predetermined number of data blocks is less than the duration time of the distribution of said first and said second chains of feed pulses derived from said predetermined number of data blocks, whereby uninterrupted workpiece machining is achieved

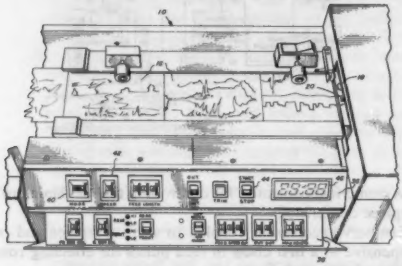
---

**4,214,310**

## MANAGEMENT DATA SYSTEM FOR PRINT SORTER

**Gerald R. Strunc, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.**

**Filed Oct. 10, 1978, Ser. No. 949,694**
**Int. Cl.² G06M *3/06***
**U.S. Cl. 364—475** **17 Claims**



1. In a photographic print cutting and sorting system in which individual photographic prints are cut from a strip of photographic paper and sorted into good, remake and reject prints as a function of remake and reject indicia associated with the remake and reject prints, respectively, a management data system comprising:

first storage means for storing a first good print count, a first remake print count, a first reject print count, a first total print count, a first good order count, a first remake order count, a first reject order count, and a first total order count;

digital processor means for incrementing the first good print count for each print cut which has neither remake nor reject indicia associated therewith, incrementing the first remake print count for each remake print indicated by the remake indica, incrementing the first reject print count for each reject print indicated by the reject indicia, incrementing the first total print count for each print cut, incrementing the first good order count for each order completed which contains only good prints, incrementing the first remake order count for each order completed which contains at least one remake print, incrementing the first reject order count for each order completed which contains at least one reject print, and incrementing the first total order count for each order completed; and

data retrieval means for retrieving data which is a function of the first counts.

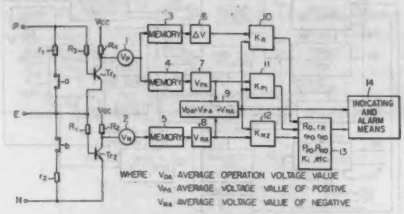
---

**4,214,311**

## METHOD AND APPARATUS FOR MEASURING INSULATION RESISTANCE

**Koichi Nakashima; Kiyosi Nagaoka, and Toshihisa Hikosaka, all of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Nov. 28, 1977, Ser. No. 855,344**
**Claims priority, application Japan, Dec. 2, 1976, 51-144905**
**Int. Cl.² G01R *27/00***
**U.S. Cl. 364—482** **6 Claims**




1. A method for providing the values needed for calculation of the insulation resistance in a non-grounded DC circuit having load means connected to the circuit comprising the steps of:

(a) selectively and successively grounding the positive line and the negative line through a measurement resistance for forceably changing the proportions among the voltage on the positive line, the voltage on the negative line and the voltage on the ground line;

(b) measuring two instantaneous voltage values from among the voltage on the positive line, the voltage on the negative line and the voltage on the ground line for both said successive groundings; and

(c) temporarily and successively storing said measured instantaneous voltage values.

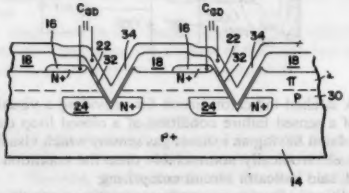
---

**4,214,312**

## VMOS FIELD ALIGNED DYNAMIC RAM CELL

**Gideon D. Amir, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.**

**Filed Jan. 8, 1979, Ser. No. 1,712**
**Int. Cl.² G11C *11/40, 11/24***
**U.S. Cl. 365—182** **5 Claims**




1. In a semiconductor memory device, including an array of single transistor memory cells comprising:

A—a substrate of low resistivity semiconductor material of a preselected polarity;

B—an epitaxial layer on said substrate having the same polarity but a higher resistivity than said substrate;

C—a series of elongated, parallel and spaced-apart bit line regions situated in and having the opposite polarity of said epitaxial layer;

D—a layer of insulative material covering said bit line regions;

E—a plurality of buried capacitor regions located within said substrate below and to one side of each said bit line

region and having the same polarity as said bit line regions;

F—a plurality of recesses having a V-shaped cross section, each having one sloping sidewall located directly adjacent to one side of a said bit line region, each said recess extending downwardly into a said buried capacitor region;

G—a thin gate dielectric material within each said recess; and

H—conductive gate means covering said gate dielectric material within each said recess and connected to an elongated word line of conductive material extending to gate means of other cells in the array in a direction generally perpendicular to said bit lines.

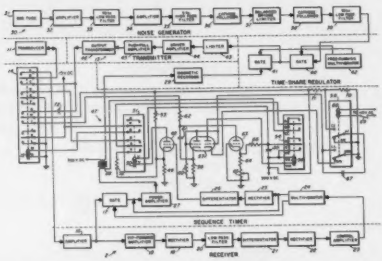
---

## 4,214,313

## MULTIPLE SONAR MASKING AND JAMMING COUNTERMEASURE SYSTEM

**Keith E. Geren; Warren A. Sauer, and Donald A. Young, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 27, 1961, Ser. No. 106,420**
**Int. Cl.² H04K *3/00***
**U.S. Cl. 367—1** **19 Claims**



1. A masking-jamming sonar countermeasure system comprising in combination, a receiver, a transmitter, a sequence timer connected between said receiver and said transmitter for regulating the operative time intervals thereof, and means coupled to the input of said transmitter for driving same with predetermined sonar signals and psuedo noise signals alternately applied thereto on a time-shared basis.

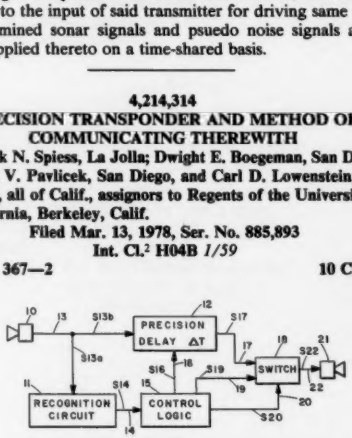
---

## 4,214,314

## PRECISION TRANSPONDER AND METHOD OF COMMUNICATING THEREWITH

**Frederick N. Spiess, La Jolla; Dwight E. Boegeman, San Diego; Frank V. Pavlicek, San Diego, and Carl D. Lowenstein, San Diego, all of Calif., assignors to Regents of the University of California, Berkeley, Calif.**

**Filed Mar. 13, 1978, Ser. No. 885,893**
**Int. Cl.² H04B *1/59***
**U.S. Cl. 367—2** **10 Claims**




1. A transponder being operative to receive first input signals followed by second input signals and to provide a precision delayed return of said second input signals in response to the detection of said first input signals regardless of any unpredictable and variable delay incurred in detecting said first input signals due to signal strength variations and the like; said transponder being comprised of;

means for receiving said first and second input signals;

means for detecting said first input signals and for generating recignition signals in response thereto anytime prior to the receipt of said second input signals;

control means for generating first control signals defining a first time interval overlapping the receipt of said second input signals, and for generating second control signals defining a second time interval following said first time interval and being of the same duration as said first time interval;

delay means for delaying all signals from said means for receiving during said first time interval in response to said first control signals, and for outputting said delayed signals during said second time interval in response to said second control signals; and

means for transmitting signals representative of said output signals from said delay means during said second time interval.

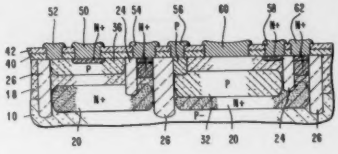
---

## 4,214,315

## METHOD FOR FABRICATING VERTICAL NPN AND PNP STRUCTURES AND THE RESULTING PRODUCT

**Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 844,767, Oct. 25, 1977, Pat. No. 4,159,915.**
**This application Mar. 16, 1979, Ser. No. 21,123**
**Int. Cl.² H01L *27/02***
**U.S. Cl. 357—44** **12 Claims**



1. A verticle NPN and PNP semiconductor device comprising:

a silicon semiconductor body composed of a substrate and an N-type epitaxial layer having regions of monocrystalline silicon isolated from one another by isolating regions;

a buried N-type region overlapping the juncture of said substrate and said epitaxial layer and located in at least one of said regions of monocrystalline silicon;

an NPN device located in said at least one of said regions of monocrystalline silicon which includes a collector reach-through connecting the surface of the monocrystalline silicon with said buried region, a base region spaced from said collector reach-through extending into said body from the surface of said body, and an emitter region within said base region extending from the surface of said body into said base region;

a PNP device located in one of said regions of monocrystalline silicon other than or containing a NPN device which includes a buried P-type emitter region connected to the surface of the monocrystalline silicon by a P-type reach-through, an N type base region above the said emitter region and a Schottky Barrier collector at the said surface of the monocrystalline silicon and within said base region; and

electrical contacts to said emitter, base and collector of said NPN device and to said emitter, base and collector of said PNP device.

4,214,316

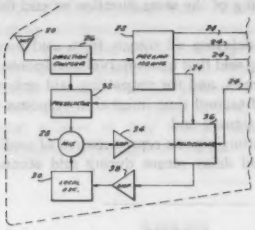
## METHOD AND APPARATUS FOR SYNCHRONOUSLY TUNING THE MULTI-CHANNEL SUPERHETERODYNE RECEIVER OF A DF SYSTEM

Stephen E. Lipsky, East Hills, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 650,905, Jan. 21, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,196

Int. Cl.[2] H04B 1/26

U.S. Cl. 455—141 46 Claims



33. In a N-channel (N>1) single band DF system of the type having N remote RF signal receiving and IF signal generating portions, each having substantially the same band coverage and each of which includes an antenna and a local oscillator, and a centrally located IF signal processing portion, operatively connected to each of said remote portions by a different set of video transmission lines, a method for synchronizing the frequency of the local oscillator of each of said remote portions, comprising the steps of: generating a local oscillator signal continuously frequency variable over a given frequency range in accordance with a frequency determining signal, combining the signal received at said antenna and the generated local oscillator signal to form an IF signal, transmitting said IF signal over the set of said transmission lines associated with said remote portion, receiving said frequency determining signal from said set of transmission lines, and transferring the received frequency determining signal to the local oscillator; and, at said central portion, the steps of: receiving the IF signal from each of the sets of transmission lines, processing the received IF signals to produce DF information, generating a frequency determining signal which is continuously frequency variable over a preselected frequency range; and transmitting said frequency determining signal over each of the sets of transmission lines.

# DESIGN PATENTS

## GRANTED JUL. 22, 1980

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D26–046 | 256,061 |

# DESIGN PATENTS

GRANTED JUL. 22, 1980

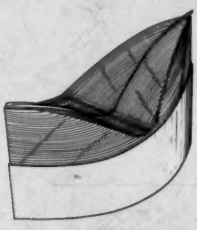
ERRATA

| Des. | |
|---|---|
| CLASS | |
| D29-040 | 256,094 |

| Des. | |
|---|---|
| CLASS | PATENT NO |
| D29-040 | 256,094 |

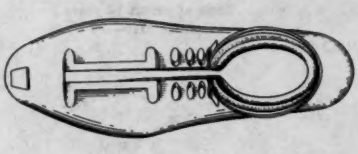
255,952
GARMENT
Milton Goldstone, New York, N.Y., assignor to The H. W. Gossard Co., Chicago, Ill.
Filed Mar. 29, 1978, Ser. No. 891,259
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—183

255,953
DISPOSABLE CAP
John S. Gates, Columbus, and James E. Randall, Worthington, both of Ohio, assignors to Lin-N-Look Company, Inc., Columbus, Ohio
Filed Jun. 5, 1978, Ser. No. 912,587
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—254



255,954
CAST BOOT OR THE LIKE
Lorraine D. Foote, 2501 Shaytown Rd., Rte. #2, Vermontville, Mich. 49096
Filed Jun. 30, 1978, Ser. No. 920,738
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—264

255,955
FIGURE SKATE BOOT
Philip V. Chiarella, Hampstead, Canada, assignor to Les Produits Sportifs Micron Inc. - Micron Sports Products Inc., Montreal, Canada
Filed Jul. 13, 1978, Ser. No. 924,389
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—275



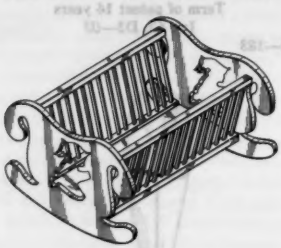
255,956
SPORTS SHOE
Ira J. Hirsch, 1107 Broadway, New York, N.Y. 10010
Filed Sep. 11, 1978, Ser. No. 941,419
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

255,957
ATHLETIC SHOE SOLE
Joseph Pasquier, Montfaucon, France, assignor to G E P, Saint Germain sur Moine, France
Filed Aug. 9, 1978, Ser. No. 933,128
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

255,958
SUN SHADE OR SIMILAR ARTICLE
Charles E. Browning, 10415 SE. 174th #5371, Renton, Wash. 98055, assignor to Charles E. Browning, Renton, Wash.
Filed Aug. 24, 1977, Ser. No. 827,163
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D3—5

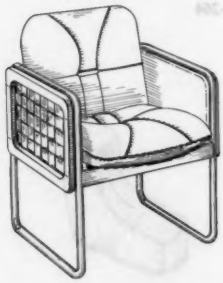
255,959
CONVERTIBLE CHAIR
Bruce D. Mitchell, 2430 Evans St., Omaha, Nebr. 68111
Filed Nov. 17, 1977, Ser. No. 852,373
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—3

255,960
CRADLE OR SIMILAR ARTICLE
Michael J. Sedillo, 8565 Stratus Dr., Orangevale, Calif. 95662
Filed Dec. 6, 1977, Ser. No. 858,003
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—15



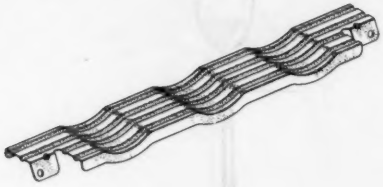
255,961
HOLDER FOR INDIVIDUAL JELLY CUPS
Charles F. Kerr, 515 Robertson Way, Sacramento, Calif. 95818
Filed May 26, 1978, Ser. No. 910,147
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

255,962
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Jan. 31, 1978, Ser. No. 873,826
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

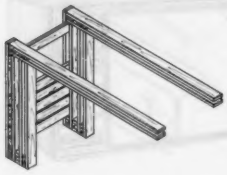


255,963
COT
Bertrand M. Baker, 109 N. Warbler La., Sarasota, Fla. 33577
Filed Feb. 22, 1978, Ser. No. 880,313
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

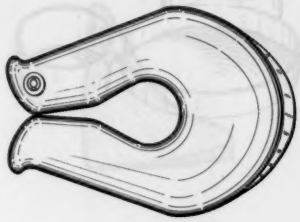
255,964
SHELF FOR SUPPORTING CANS
Bernard T. Anderson, Garden Grove, and Theodore Yedinak, Fountain Valley, both of Calif., assignors to B & T Manufacturing Corporation, Garden Grove, Calif.
Filed Jul. 3, 1978, Ser. No. 921,479
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181



255,965
SUPPORT FOR USE WITH ELECTRONIC COMPUTER UNITS
David A. O'Connor, Virginia Beach, Va., assignor to Virginia National Bankshares, Inc., Norfolk, Va.
Division of Ser. No. 669,604, Mar. 23, 1976. This application Feb. 24, 1978, Ser. No. 880,977
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191



255,966
INFLATABLE RECREATIONAL CUSHION
Myrtle Stadel, 3902 Walton Dr., Lansing, Mich. 48910
Filed Jul. 10, 1978, Ser. No. 923,042
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



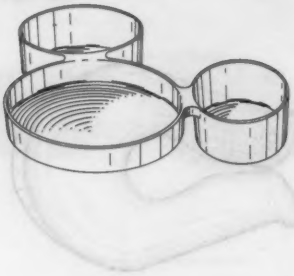
255,967
CUP
Niels R. Andersen, Rude, Denmark, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Jun. 1, 1977, Ser. No. 802,385
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

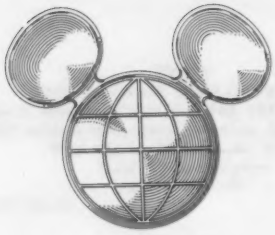
255,968

**COMPARTMENTED SERVING TRAY**

David A. Shack, 2160 Lyndway Rd., Beachwood, Ohio 44122

Filed May 24, 1978, Ser. No. 908,995
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



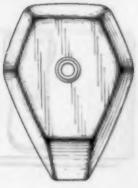


255,969

**JUICE EXTRACTOR ATTACHMENT FOR A MIXER**

Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation

Filed Jul. 13, 1978, Ser. No. 924,314
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—48

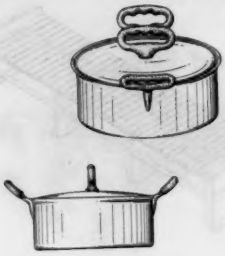


255,970

**PAN**

Bonnie K. Lackmann, 620 Madison, Anoka, Minn. 55303

Filed Mar. 30, 1978, Ser. No. 891,932
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—97



255,971

**TURNER OR THE LIKE**

Roger L. Kelly, Palatine, Ill., assignor to American Home Products Corporation, New York, N.Y.

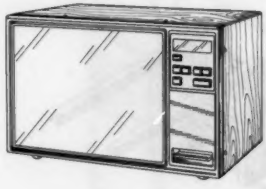
Filed Aug. 28, 1978, Ser. No. 937,494
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—102

255,972

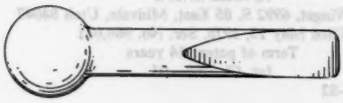
**MICROWAVE OVEN**

Daisaku Mori; Yoichi Takahashi, both of Kouriyama, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

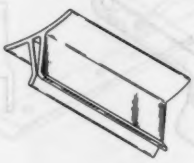
Filed Mar. 23, 1978, Ser. No. 889,586
Claims priority, application Japan, Oct. 4, 1977, 52-39563
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



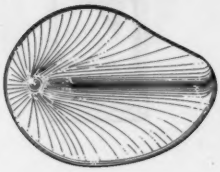
255,973
**SPOON**
Andre Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,501
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138



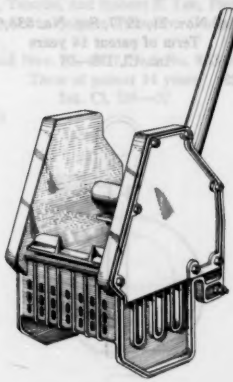
255,974
**DETACHABLE FINGER GUARD FOR A KNIFE BLADE**
Charles E. Jacoby, 2142 Covington Ave., Bethlehem, Pa. 18017
Filed Nov. 7, 1977, Ser. No. 848,973
Term of patent 14 years
Int. Cl. D07—*03, 99*
U.S. Cl. D7—152



255,975
**KNEADING BLADE FOR A FOOD MACHINE**
Teruo Masuda, Itsukaichi, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan
Filed Oct. 31, 1978, Ser. No. 956,346
Term of patent 14 years
Int. Cl. D15—*08;* D07—*04*
U.S. Cl. D7—160



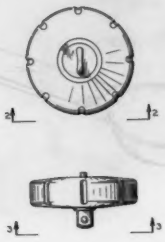
255,976
**DOWNWARD PRESSURE MOP WRINGER**
Dale T. Maza, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 23, 1977, Ser. No. 863,899
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—187



255,977
BLOW-THROUGH FIREPLACE POKER
Howard A. Holleman, Bay Village, Ohio, assignor to Hydro Tube Corporation, Oberlin, Ohio
Continuation-in-part of Ser. No. 714,819, Aug. 16, 1976, Pat. No. Des. 248,209. This application May 31, 1978, Ser. No. 911,295
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—210

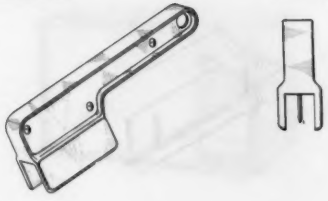
255,978
RATCHET WRENCH LEVER
Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391
Filed Nov. 21, 1977, Ser. No. 853,640
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25

255,979
RATCHET TOOL HANDLE
Raymond O. Boursaw, Rte. 3, Box 1230, Rainier, Oreg. 97048
Filed May 12, 1978, Ser. No. 905,419
Term of patent 14 years
Int. Cl. D08—*06*
U.S. Cl. D8—25



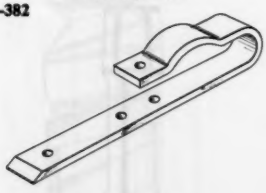
255,980
ANGLE SNIPS
Quenton F. Winget, 6992 S. 85 East, Midvale, Utah 84047
Filed May 15, 1978, Ser. No. 906,031
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—52

255,981
RECORD ALBUM JACKET OPENER
Henry Carbo, 5137 West Blvd., Los Angeles, Calif. 90043
Filed Sep. 19, 1977, Ser. No. 834,665
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

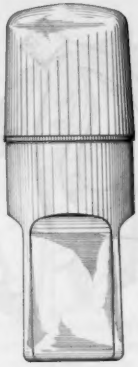


255,982
FAN BRACKET
Albert R. Germann, 2121 E. 12th, Apt. 1, Winfield, Kans. 67156
Filed Feb. 17, 1978, Ser. No. 879,010
Term of patent 7 years
Int. Cl. D8—*08*
U.S. Cl. D8—366

255,983
CARGO RESTRAINT CLIP
George W. Armstrong, Farmingdale, and Eric G. Aronson, Livingston, both of N.J., assignors to Sea-Land Service, Inc., Elizabeth, N.J.
Filed Sep. 15, 1977, Ser. No. 833,598
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



255,984
BOTTLE
Edward C. Kozlowski, Trumbull, Conn., and John D. Campbell, Northport, N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Nov. 9, 1977, Ser. No. 850,005
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—1



255,985
BOTTLE
Barry G. Seelig, Tuxedo, and Robert E. Lee, Pound Ridge, both of N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 18, 1977, Ser. No. 853,009
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—61

255,986

BOTTLE OR SIMILAR ARTICLE

Ta-Peng Chang, Cliffside Park, and Lois B. Pritchard, Glen Rock, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,665

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—64

255,987

BOTTLE

Giovanni Gentili, Bologna, Italy, assignor to Panigal S.p.A. Saponerie Italiane Conserve Pecori S.p.A., Bologna, Italy

Filed Nov. 8, 1977, Ser. No. 850,068

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 801

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—71

255,988

BEVERAGE CONTAINER

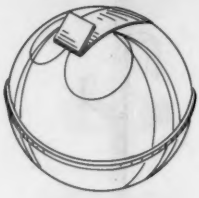
Carmen T. Mascia, Clarendon Hills, and Gary K. Hasegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Aug. 25, 1977, Ser. No. 827,533

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—83



255,989

COMBINED BOTTLE AND CAP

Frank F. Lipsz, St. Laurent, Canada, assignor to Leabrooke Manufacturing Inc., Montreal, Canada

Filed Sep. 26, 1977, Ser. No. 836,911

Claims priority, application Canada, Aug. 29, 1977, 2908771

Term of patent 14 years

Int. Cl. D9—*01*

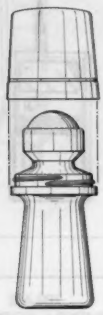
U.S. Cl. D9—131

255,990

**COMBINED BOTTLE AND CAP**

Michael P. Lucas, Hingham, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Mar. 20, 1978, Ser. No. 888,598
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—147

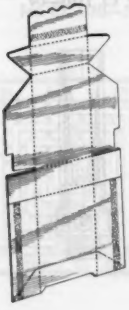


255,991

**FLIP TOP DISPENSER BOX BLANK**

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 4, 1977, Ser. No. 848,495
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245

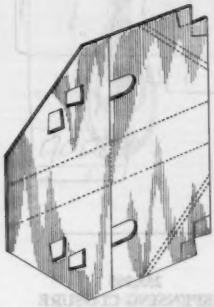


255,992

**CORNER PAD BLANK**

David R. Card, Memphis, Tenn., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 5, 1977, Ser. No. 857,404
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245

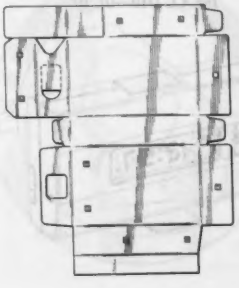


255,993

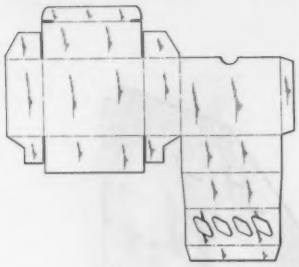
**SLIDE TOP CARTON BLANK OR SIMILAR ARTICLE**

Herbert L. Lambert, Manchester, Mo., assignor to Champion International Corporation, Stamford, Conn.

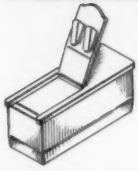
Filed Mar. 9, 1978, Ser. No. 884,860
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



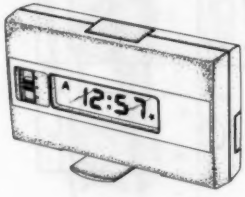
255,994
BLANK FOR A FOLDABLE CARTON
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 29, 1978, Ser. No. 891,475
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



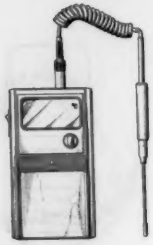
255,995
DISPENSING CLOSURE
William G. Kinslow, Kansas City, Mo., assignor to Ethyl Development Corporation, Baton Rouge, La.
Filed May 22, 1978, Ser. No. 908,056
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—275



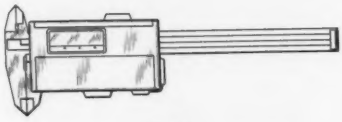
255,996
POCKETABLE WATCH
Shuichi Tamura, Tokyo, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan
Filed May 31, 1978, Ser. No. 911,092
Claims priority, application Japan, Dec. 2, 1977, 52-47567
Term of patent 14 years
Int. Cl. D10—*01, 02*
U.S. Cl. D10—15




255,997
ELECTRONIC THERMOMETER
Hisashi Maeda, Nagaokakyo, Japan, assignor to Omron Tateishi Electronics Co., Kyoto, Japan
Filed Oct. 18, 1977, Ser. No. 843,358
Claims priority, application Japan, Apr. 18, 1977, 52-14610[U]
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



255,998
CALIPER
H. Jackson Merchant, North Scituate, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Filed Apr. 17, 1978, Ser. No. 896,994
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

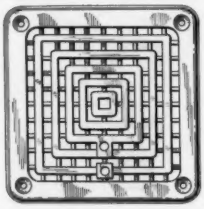


255,999
FLUID FLOW INDICATOR
Sture G. Molijn, Linköping, Sweden, assignor to Mobil Oil AB Sweden, Danderyd, Sweden
Filed Apr. 6, 1978, Ser. No. 893,954
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

256,000
FLUID FLOW INDICATOR
Sture G. Molijn, Linköping, Sweden, assignor to Mobil Oil AB Sweden, Danderyd, Sweden
Filed Apr. 7, 1978, Ser. No. 894,630
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

256,001
REFLECTOR ASSEMBLY
Mike H. Curran, 1738 E. Montecito, Phoenix, Ariz. 85016
Filed Mar. 27, 1978, Ser. No. 890,852
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

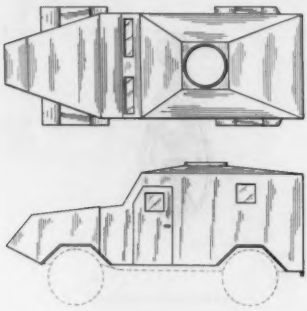
256,002
HORN GRILLE
Owen G. Price, Mokena, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.
Filed May 15, 1978, Ser. No. 905,579
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121



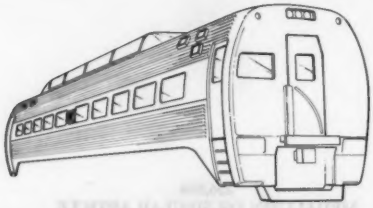
256,003
EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 29, 1978, Ser. No. 947,242
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—43

256,004
MEDALLION OR SIMILAR ARTICLE
Ellena M. E. Freeman, 5376 Magnolia St., Philadelphia, Pa. 19144
Filed Jan. 19, 1978, Ser. No. 817,093
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D11—110

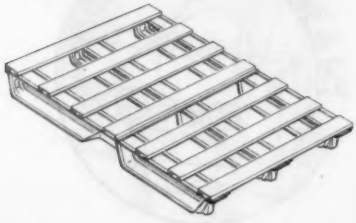
256,005
ARMORED CAR BODY
Russell E. Bauer, 920 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Oct. 11, 1977, Ser. No. 844,791
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



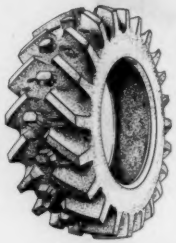
256,006
RAILWAY CAR BODY
John Cuccio, Westport, and Mace H. Bell, Jr., Rowayton, both of Conn., assignors to The Budd Company, Troy, Mich.
Filed Jan. 3, 1978, Ser. No. 866,482
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—40



256,007
PALLET
Gerald M. Chillog, 1531 La Colina, Tustin, Calif. 92705
Filed Feb. 21, 1978, Ser. No. 879,686
Term of patent 7 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



256,008
TIRE
Jean Menin, Maurecourt, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, France
Filed Nov. 29, 1978, Ser. No. 964,456
Claims priority, application France, Jul. 13, 1978, 78 41567
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



256,009
SKI RACK FOR AN AUTOMOBILE OR THE LIKE
Daniel C. Mendenhall, 15370 NW. Norwich St., Beaverton, Oreg. 97005
Filed May 10, 1978, Ser. No. 904,638
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

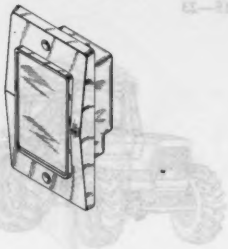
256,010
TERMINAL CONNECTOR COVER
William L. Fry, Haughton, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Sep. 24, 1976, Ser. No. 726,343
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

256,011

**LIGHT-INTENSITY CONTROL CONTACT SWITCH OR THE LIKE**

Takehiko Matsuda, Matsudo, Japan, assignor to Toyostar Corporation, Tokyo, Japan

Filed Feb. 15, 1979, Ser. No. 12,510
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38



256,012

**LIGHT-INTENSITY CONTROL CONTACT SWITCH OR THE LIKE**

Takehiko Matsuda, Matsudo, Japan, assignor to Toyostar Corporation, Matsudo, Japan

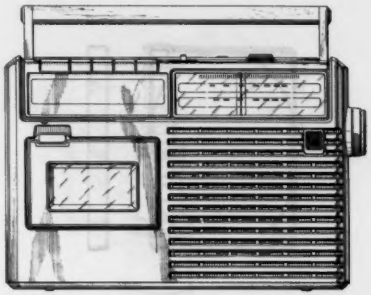
Filed Mar. 20, 1979, Ser. No. 22,373
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

256,013

**COMBINED CASSETTE TAPE PLAYER AND RADIO**

Richard Culbertson, Manlius, N.Y., assignor to General Electric Company

Filed Sep. 21, 1977, Ser. No. 835,409
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

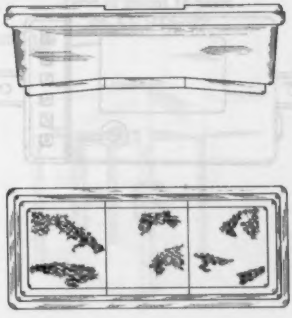


256,014

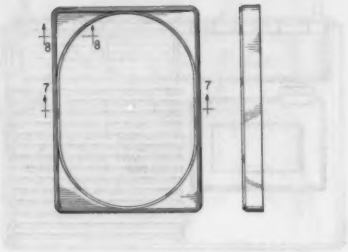
**VEHICLE SPEAKER**

Robert A. Noga, 13404 Calais Dr., Del Mar, Calif. 92014

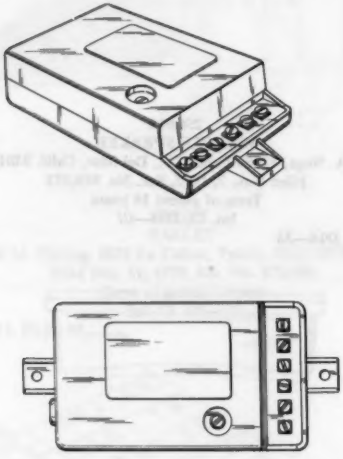
Filed Nov. 7, 1977, Ser. No. 849,072
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



256,015
**LOUDSPEAKER MOUNTING BRACKET**
Glenn F. Doherty, Newburyport, Mass., assignor to Epicure Products, Inc., Newburyport, Mass.
Filed Mar. 20, 1978, Ser. No. 888,518
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—37

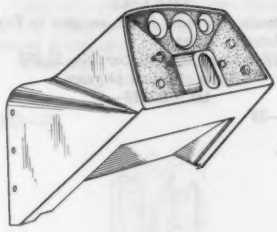


256,016
**RADIO TRANSMITTER**
Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan
Filed Feb. 21, 1978, Ser. No. 879,620
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—95



256,017
**TRACTOR**
Horst Emundts, Bochum, and Peter Kramer, Troisdorf-Spich, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany
Filed Mar. 6, 1978, Ser. No. 884,022
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 436238
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23

256,018
**TRACTOR CONSOLE**
Lawrence J. Stone, Livonia, and Richard J. Wells, Ferndale, both of Mich., assignors to Massey-Ferguson Inc.,, Detroit, Mich.
Filed Mar. 13, 1978, Ser. No. 886,002
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



256,019

**HOT AIR CORN POPPER**

Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Wayne J. Franek, Palatine, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.

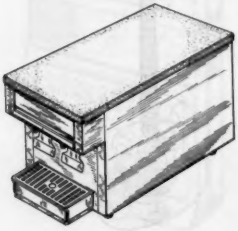
Filed Apr. 10, 1978, Ser. No. 895,003
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—105

256,020

**BEVERAGE DISPENSER**

Craig A. Swanson, Ramsey, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Apr. 10, 1978, Ser. No. 894,669
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—112



256,021

**EXPANDABLE ELEMENT FOR HOLDING A WORKPIECE TO BE TOOLED**

Sixten Jansson, Industrihuset, 950 10 Lulea, Sweden

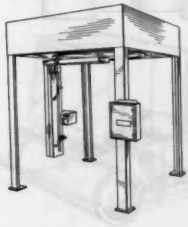
Filed Dec. 29, 1977, Ser. No. 865,888
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140

256,022

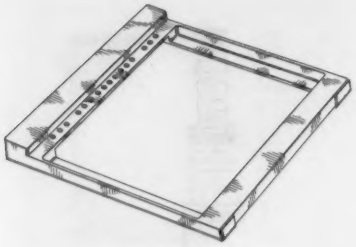
**WRAPPING APPARATUS FOR PALLETIZED LOADS**

Michael H. Shulman, 45 Bruce Farm Dr., Willowdale, Ontario, Canada

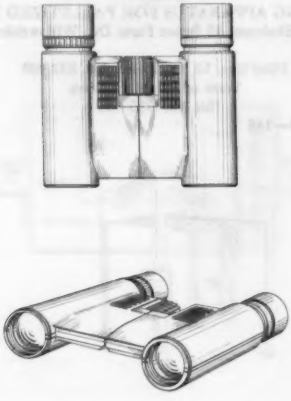
Filed Sep. 13, 1977, Ser. No. 832,989
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145



256,023
STAGE FOR TRANSPARENCY PROJECTION
Paul Constantine, New York; Melvyn Ettinger, East Meadow, both of N.Y., and Harry S. Rubin, Willow Grove, Pa., assignors to Instructo/McGraw-Hill, Inc., Paoli, Pa.
Filed Dec. 1, 1977, Ser. No. 856,414
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—26



256,024
BINOCULARS
Seijiro Noda, Yokohama, and Hitoshi Suyama, Tokyo, both of Japan, assignors to Nippon Kogaku K.K.
Filed Apr. 19, 1978, Ser. No. 897,933
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59



256,025
SPECTACLE FRAME EYE PIECE
Shari Lewis, Beverly Hills, Calif., assignor to SLS Entertainment Enterprises, Inc., Hollywood, Calif.
Filed Jun. 1, 1978, Ser. No. 911,362
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—78

256,026
GUITAR
Adrian B. McCracken, 228 Galest, Chillicothe, Mo. 64601
Filed Jun. 12, 1978, Ser. No. 914,594
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

256,027

**COMBINATION COUNTER AND TABULATOR FOR CONTROLLING FOOD INTAKE**

Spencer L. Mackay, Canoga Park; Frederick G. Mackay, and Allan B. Johnson, both of Tarzana, all of Calif., assignors to Teledyne Industries, Inc.

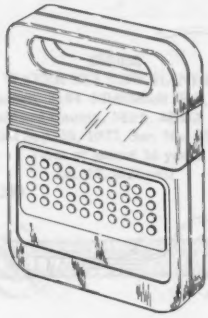
Filed Sep. 26, 1977, Ser. No. 836,604
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—6

256,028

**CASE FOR AN ELECTRONIC LEARNING AID, GAME OR SIMILAR APPARATUS**

William J. Lawrence, and Richard R. Nesbitt, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,549
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60

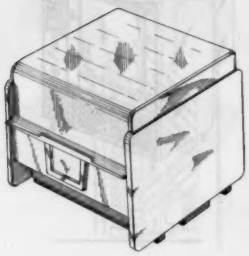


256,029

**HINGED TOP CARD FILE**

James F. Hampshire; Greg P. Terek, and Richard C. Sankovich, all of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Dec. 12, 1977, Ser. No. 859,955
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

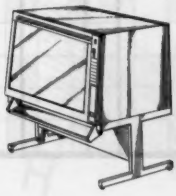


256,030

**VENDING MACHINE**

Theodore C. Youngkin, North Hollywood, and Richard R. Stutsman, Mt. Baldy, both of Calif., assignors to Rod Pierce & Associates, Marina del Rey, Calif.

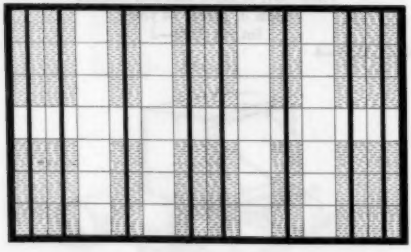
Filed Nov. 4, 1977, Ser. No. 848,451
Term of patent 14 years
Int. Cl. D20—*1*
U.S. Cl. D20—4



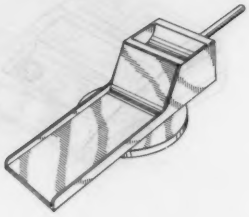
256,031
VENDING MACHINE
Walter E. Moore, Bel-Nor, and Albert K. Grethey, Bridgeton, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.
Filed Sep. 22, 1978, Ser. No. 944,883
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—4

256,032
ILLUMINATED SIGN
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Feb. 22, 1978, Ser. No. 880,238
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

256,033
GAME BOARD
Michael H. Saint Ive, Englewood, Colo., assignor to Lagess Corp., Englewood, Colo.
Filed Sep. 14, 1978, Ser. No. 942,407
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



256,034
CARD AND CHIP RACK
Lee A. Beaman, 3312 NE. 259th St., Ridgefield, Wash. 98642
Filed Jun. 5, 1978, Ser. No. 912,242
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—55



256,035
SCOOTER OR SIMILAR ARTICLE
Robert L. Lockhart, 1442 92nd Ave., Oakland, Calif. 94603
Filed Apr. 18, 1978, Ser. No. 897,533
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—81

256,036

**BALL GAME TRACKWAY**

Hon Y. Fu; Hon Y. Hin, and Hon Y. Wing, all of Room 904-5, Easy Commercial Bldg., 253-261 Hennessy Rd., Hong Kong, Hong Kong

Filed Apr. 17, 1978, Ser. No. 896,913
Claims priority, application United Kingdom, Nov. 3, 1977, 982153/77
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—92

256,037

**DESK GAME PUZZLE**

Frank S. Csoka, Sea Cliff, N.Y., assignor to Fun Things, Inc., New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,472
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104

256,038

**WATER SKI TOW HANDLE**

Dwight W. Presser, 3184 Middlebelt Rd., West Bloomfield Township, Oakland County, Mich. 48033

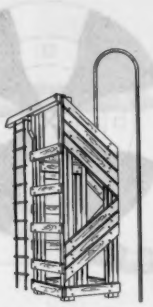
Filed Sep. 26, 1977, Ser. No. 836,691
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230

256,039

**PLAYGROUND STRUCTURE**

Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.

Filed Nov. 17, 1977, Ser. No. 852,583
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—244

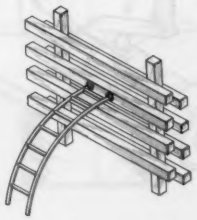


256,040

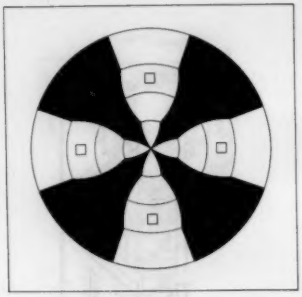
**CHILD RECREATION CLIMBER STRUCTURE**

Frank W. Beller, Aurora, Ill., assignor to Recreation Systems Co., North Aurora, Ill.

Filed Jul. 31, 1978, Ser. No. 929,826
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245

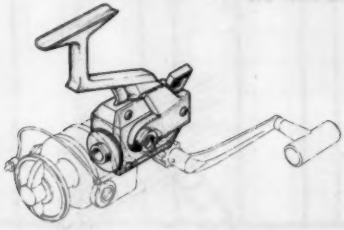


256,041
GUN TARGET
Charles R. Dulude, 33 Burnside Ave., East Hartford, Conn. 06108
Filed Apr. 7, 1978, Ser. No. 894,644
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—15



256,042
HANDLE FOR A FISHING ROD
Katsuhiko Shimodaira, No. 14-8, Miyasaka 3-chome, Setagaya-ku, Tokyo, Japan
Filed Jul. 18, 1978, Ser. No. 925,711
Claims priority, application Japan, Mar. 14, 1978, 53-539551
Term of patent 7 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

256,043
FISHING SPINNING REEL BODY OR THE LIKE
Tetsuyuki Doi, and Masakazu Sakamoto, both of Fukuyama, Japan, assignors to Ryobi Limited
Filed Mar. 15, 1978, Ser. No. 886,858
Claims priority, application Japan, Sep. 21, 1977, 52-37906
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

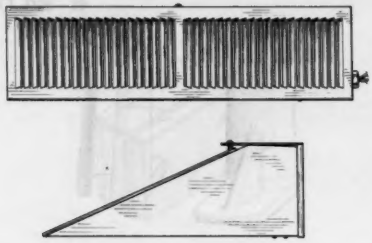


256,044
FISHING LURE
William D. Storm, Norman, Okla., assignor to Storm Plastics, Inc., Norman, Okla.
Filed Dec. 8, 1977, Ser. No. 858,731
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

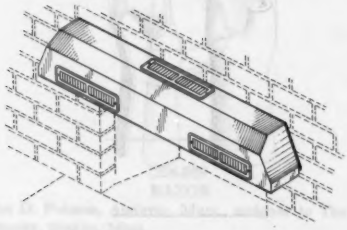
256,045
FISHING LURE
Nicholas A. Philips, P.O. Box 1273, Traverse City, Mich. 49684
Filed Jan. 16, 1978, Ser. No. 869,933
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—28

256,046
PIPE CLAMP SEAL
Duane O. Perrin, 2522 232nd St., Torrance, Calif. 90505
Filed Jun. 27, 1978, Ser. No. 919,743
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—47

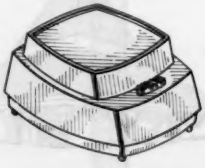
256,047
**HEAT EXCHANGER**
Garold L. Wormington, 600 S. Scenic, Springfield, Mo. 65802
Filed Dec. 27, 1977, Ser. No. 864,923
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—115



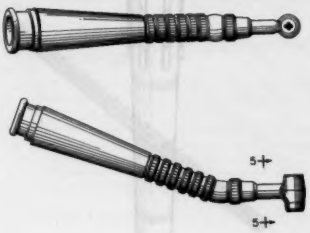
256,048
**FIREPLACE HOOD**
Rex M. Brown, 435 E., 1st N., Smithfield, Utah 84335
Continuation of Ser. No. 749,298, Dec. 10, 1976, abandoned, which is a continuation of Ser. No. 606,064, Aug. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 538,100, Jan. 2, 1975, all abandoned. This application Feb. 1, 1978, Ser. No. 874,543
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—151



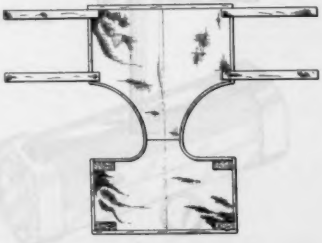
256,049
**STERILIZER UNIT**
Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Hanover Park, Ill.
Filed Mar. 3, 1978, Ser. No. 883,344
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



256,050
**DENTAL HANDPIECE**
John D. Nilles, Roselle, and Stanley L. Stankiewicz, Chicago, both of Ill., assignors to American Hospital Supply Corporation
Filed May 30, 1978, Ser. No. 910,968
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12



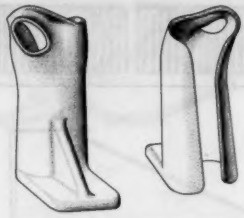

256,051
**HOSPITAL GARMENT**
Mary D. Hardison, 1505 - 42nd St., West Palm Beach, Fla. 33407
Filed Nov. 4, 1977, Ser. No. 848,319
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—50



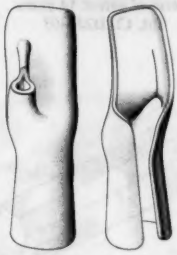
256,052
PIPETTE TIP
Donald H. De Vaughn, San Francisco, Calif., assignor to Bio-Plas, San Francisco, Calif.
Filed Oct. 25, 1977, Ser. No. 845,250
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—55

256,053
SPECIMEN DEVICE
Carl J. Steigerwald, Wauconda, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Apr. 20, 1978, Ser. No. 898,004
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

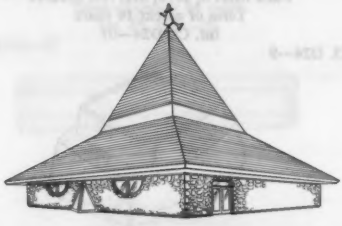
256,054
WRIST IMMOBILIZER
Alan Finnieston, 1901 NW. 17th Ave., Miami, Fla. 33125
Filed Mar. 16, 1978, Ser. No. 887,460
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



256,055
WRIST AND HAND ZONE IMMOBILIZER
Alan Finnieston, 1901 NW. 17th Ave., Miami, Fla. 33125
Filed Apr. 4, 1978, Ser. No. 893,607
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



256,056
BUILDING
Willis J. Gottschalk, 711 E. Highway 212, Watertown, S. Dak. 57201
Filed Feb. 22, 1978, Ser. No. 880,324
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—9

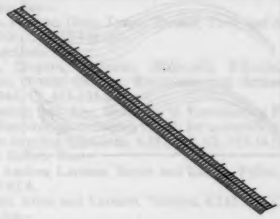


256,057
FOG LIGHT
Matsuo Ichikawa, Takasaki, Japan, assignor to Ichikawa Press Industries Co., Ltd., Takasaki, Japan
Filed Jul. 18, 1978, Ser. No. 925,888
Claims priority, application Japan, Mar. 10, 1978, 53/8976
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—29

256,058
HANGING ASH RECEIVER OR THE LIKE
James O. Brooks, 11840 Chandler Blvd., Apt. 206, North Hollywood, Calif. 91607
Filed Jan. 5, 1978, Ser. No. 867,287
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—14

256,059
RAZOR
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Jun. 26, 1978, Ser. No. 919,034
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

256,060
POULTRY CAGE EGG RAMP
Gerald L. Kitson, 9709 Belding Rd. NE., Rockford, Mich. 49341
Continuation-in-part of Ser. No. 481,390, Jun. 20, 1974, Pat. No. D. 247,450, which is a continuation-in-part of Ser. No. 409,019, Oct. 23, 1973, Pat. No. D. 241,356, which is a continuation-in-part of Ser. No. 130,861, Apr. 2, 1971, Pat. No. D. 228,802. This application Dec. 30, 1977, Ser. No. 866,069
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



256,061
COMBINED PORTABLE SPOT/FLOOD LIGHT
Thomas Zelina, Erie, Pa., assignor to Lighting Systems, Erie, Pa.
Continuation-in-part of Ser. No. 729,587, Oct. 4, 1976, Pat. No. Des. 247,457. This application Dec. 19, 1977, Ser. No. 862,144
The portion of the term of this patent subsequent to Mar. 7, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—46

256,062

**NONWOVEN SHEET MATERIAL OR THE LIKE**

Charlotte D. Joachim, Cincinnati, Ohio; Alvin C. March, Aurora, Ind., and Kay S. Ratliff, Hamilton, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

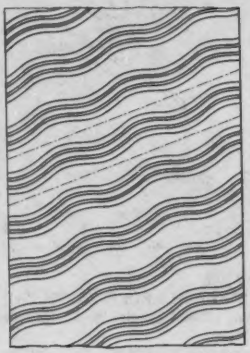
Filed Nov. 13, 1978, Ser. No. 960,135
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 P

256,063

**NONWOVEN SHEET MATERIAL OR THE LIKE**

Klaus Burg, Teaneck, N.J., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 27, 1978, Ser. No. 964,016
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 P



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Cooper, Robert N., 4,213,872, Cl. 430-114.000.

A. Raymond: *See*—
Pierron, Claude; and Kirchgaesser, Johannes, 4,213,589, Cl. 248-74.00R.

Aanonsen, Bent; Odberg, Paul-Johny; and Samuelsen, Eirik, to Dyno Industries A.S. Method and apparatus for the continuous production of a slurry explosive containing an emulsified liquid component. 4,213,712, Cl. 366-178.000.

AB Kabi: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.

AB Volvo: *See*—
Pilhall, Stig T. L., 4,213,675, Cl. 350-307.000.

Abbott Laboratories: *See*—
Carney, Ronald E.; and Hanessian, Stephen, 4,214,077, Cl. 536-17.00R.
Carney, Ronald E., 4,214,080, Cl. 536-17.00R.
Goldstein, Alma W.; and Fager, Earl E. C., 4,214,078, Cl. 536-17.00R.
Martin, Jerry R., 4,213,972, Cl. 424-181.000.
Martin, Jerry R., 4,213,974, Cl. 424-180.000.
Martin, Jerry R., 4,214,079, Cl. 536-17.00R.
McAlpine, James B., 4,213,971, Cl. 424-181.000.
McAlpine, James B., 4,214,076, Cl. 536-17.00R.
Tadanier, John S.; and Martin, Jerry R., 4,214,075, Cl. 536-17.00R.

Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, to Nissan Motor Company, Limited. Low-noise-level reciprocating piston engine. 4,213,440, Cl. 123-195.00C.

Abe, Shunichi: *See*—
Akiyama, Mistuo; and Abe, Shunichi, 4,213,692, Cl. 355-14.00D.

Abeler, Gerd; and Maul, Rudolf, to Ciba-Geigy Corporation. 1,4-Dihydro-2,6-dimethylpyridene-3,5-dicarboxylic esters. 4,214,088, Cl. 546-321.000.

Abersfelder, Gunter: *See*—
Andres, Rudolf; Grantz, Helmut; Abersfelder, Gunter; and Busch, Gerhard, 4,213,581, Cl. 242-107.40R.

Able, Edward T.: *See*—
Krieger, Raymond L.; Weaver, Ralph W.; and Able, Edward T., 4,213,333, Cl. 73-136.00R.

Absler, Howard; Juszak, Joseph; and Gore, Thomas, to Uarco Incorporated. Continuous business form assembly. 4,213,639, Cl. 282-11.50A.

ACF Industries, Incorporated: *See*—
Orum, Paul R.; and Yvvial, Larry A., 4,213,480, Cl. 137-556.000.
VanDyke, Ronald D., 4,213,590, Cl. 410-64.000.

Adams, Nancy: *See*—
Gueret, Jean-Louis H.; and Adams, Nancy, 4,213,472, Cl. 132-88.700.

Adams, William M.; Blakely, Robert F.; Ellis, Charles R.; and Mead, Judson, to Indiana University Foundation. Seismic trigger. 4,214,238, Cl. 340-690.000.

Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, to BASF Aktiengesellschaft. Insecticidal carbamates. 4,213,992, Cl. 424-273.00P.

Adolphi, Heinrich: *See*—
Loeffler, Hans-Peter; Adolphi, Heinrich; and Kiehs, Karl, 4,213,976, Cl. 424-224.000.

Adrian, Rudolf: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,214,095, Cl. 560-57.000.

Advanced Design and Construction: *See*—
Hardesty, Robert D., 4,213,628, Cl. 280-412.000.

Advanced Technology Laboratories, Inc.: *See*—
Parker, Edward J.; and Behlen, James C., Jr., 4,214,269, Cl. 358-140.000.

af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., to AB Kabi. Assay of serine proteases using novel chromogenic enzyme substrates. 4,214,049, Cl. 435-23.000.

AGA Heating AB: *See*—
Asikainen, Aimo, 4,213,864, Cl. 210-151.000.

Agency of Industrial Science and Technology, The: *See*—
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,213,857, Cl. 210-6.000.

AHI Operations Limited: *See*—
Wenham, Douglas L., 4,213,341, Cl. 73-421.00A.

Ahmed, Quazi: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,214,095, Cl. 560-57.000.

Ahrweiler, Karl-Heinz, to Eduard Kusters. Press for compacting material to form a traveling web. 4,213,748, Cl. 425-371.000.

Ainger, George E.; and Caverly, Brian L., to Lever Brothers Company. Fat compositions. 4,214,012, Cl. 426-607.000.

Air Industrie: *See*—
Guibet, Jean-Pierre, 4,213,771, Cl. 55-483.000.

Airco, Inc.: *See*—
Jones, George D., 4,214,155, Cl. 250-231.00R.

Aisin Seiki Kabushiki Kaisha: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,213,535, Cl. 220-20.500.

Akagi, Kimiko: *See*—
Komatsu, Makoto; Ohta, Tazuo; Tanaka, Toru; and Akagi, Kimiko, 4,214,100, Cl. 562-416.000.

Akimoto, Hidetoshi: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.

Akiyama, Mistuo; and Abe, Shunichi, to Konishiroku Photo Industry Co., Ltd. Bias voltage switching circuit for controlling concentration of image in copying apparatus. 4,213,692, Cl. 355-14.00D.

Aktiebolaget Bofors: *See*—
Boberg, Anders; Larsson, Bernt; and Lundh, Folke, 4,213,885, Cl. 260-29.6TA.
Johansson, Arne; and Larsson, Torsten, 4,213,257, Cl. 37-142.00R.

Akzo N.V.: *See*—
Kunnen, Jan; and Van Der Schee, Abraham C., 4,214,022, Cl. 427-435.000.
Smakman, Robert; and van den Berg, Gerrit H., 4,213,859, Cl. 210-27.000.

Akzona Incorporated: *See*—
Brodowski, Walter; and Wallrabenstein, Michael, 4,213,890, Cl. 260-45.75W.
O'Connor, John J., 4,213,764, Cl. 23-230.00B.

Alamance Industries, Inc.: *See*—
Safrit, Sam C.; Cassidy, Edward L., Sr.; Cothran, William B.; and Farrell, Roscoe M., 4,213,312, Cl. 66-177.000.

Albanese, Vincent M., to Nalco Chemical Company. Electrostatic precipitation. 4,213,767, Cl. 55-5.000.

Alberti, John D. Method of making picture phonograph record. 4,213,927, Cl. 264-107.000.

Alburn, Harvey E.: *See*—
Fenichel, Richard L.; Wei, Peter H. L.; Gregory, Francis J.; and Alburn, Harvey E., 4,214,089, Cl. 548-151.000.

Alcan Research and Development Limited: *See*—
Dewing, Ernest W.; Huni, Jean-Paul R.; Sood, Raman R.; and Southam, Frederick W., 4,213,599, Cl. 266-166.000.

Aldridge, R. Warren, Jr. Align boring machine. 4,213,721, Cl. 408-54.000.

Alexander, John D.: *See*—
Bogert, Clayton; Alexander, John D.; and Krautheim, Leonard, 4,213,359, Cl. 82-47.000.

All American Products Company, Inc.: *See*—
Shaw, Nathan O., 4,213,658, Cl. 308-15.000.

All Nighter Stove Works, Inc.: *See*—
Morande, James A., Jr., 4,213,443, Cl. 126-72.000.

Allegheny Ludlum Industries, Inc.: *See*—
Datta, Amitava, 4,213,804, Cl. 148-111.000.

Allied Chemical Corporation: *See*—
Mares, Frank; and Jacobson, Stephen E., 4,213,906, Cl. 260-343.000.
Zudkevitch, David; Khanna, Nirmal K.; and Raczynski, Robert F., 4,213,832, Cl. 203-95.000.

Aluminum Company of America: *See*—
Martin, Edward S., 4,213,943, Cl. 423-135.000.

Alvino, William M.; and Frost, Lawrence W., to Westinghouse Electric Corp. Amide-imide polymers. 4,214,071, Cl. 528-222.000.

Ambartsumyan, Nikolai S.: *See*—
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.

AMCA International Corporation: *See*—
Heckelsberg, Robert E., 4,213,282, Cl. 52-404.000.

Amerace Corporation: *See*—
Goldberg, Bruce S.; and Shah, Mahendra, 4,213,815, Cl. 156-244.110.

American Can Company: *See*—
Boardman, Alfred H., 4,213,538, Cl. 220-268.000.
Gold, Vance B.; and Vandlik, Robert P., 4,213,319, Cl. 72-34.000.
Meyers, George L., 4,213,559, Cl. 229-16.00D.

American Cyanamid Company: *See*—
Lovell, James B., 4,213,988, Cl. 424-251.000.

American HCP: *See*—
Vandenbossche, Benjamin E., 4,213,498, Cl. 165-136.000.

American Hoechst Corporation: *See*—
Heberger, John M., 4,214,035, Cl. 428-340.000.
Walls, John E.; and Gillich, Thomas N., 4,213,887, Cl. 260-29.60E.

American Home Products Corporation: *See*—
Fenichel, Richard L.; Wei, Peter H. L.; Gregory, Francis J.; and Alburn, Harvey E., 4,214,089, Cl. 548-151.000.
Immer, Hans U.; Nelson, Verner R.; and Gotz, Menfred K., 4,213,895, Cl. 260-112.50R.
Wetzel, Jon C., 4,213,981, Cl. 424-247.000.

American Microsystems, Inc.: *See*—
Amir, Gideon D., 4,214,312, Cl. 365-182.000.

American Seating Company: *See*—
Sulewsky, James E., 4,213,516, Cl. 181-286.000.

American Standard Inc.: *See*—
Ruff, Robert O., 4,213,317, Cl. 70-450.000.

Amiot, Jacques H. J., to Moulinex, Societe Anonyme. Domestic electrical appliance. 4,213,569, Cl. 241-37.500.

Amir, Gideon D., to American Microsystems, Inc. VMOS Field aligned dynamic ram cell. 4,214,312, Cl. 365-182.000.

AMP Incorporated: *See*—
Kourimsky, Friedrich J. A., 4,214,223, Cl. 337-293.000.

Analog Devices, Incorporated: *See*—
Tsang, Wei K., 4,213,806, Cl. 148-187.000.

Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., to International Business Machines Corporation. Method for fabricating vertical NPN and PNP structures and the resulting product. 4,214,315, Cl. 357-44.000.

Anderson, Brian: *See*—
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., 4,213,899, Cl. 260-156.000.

Anderson, J. Hilbert. Vortex generator for separating a gaseous and liquid refrigerant. 4,213,308, Cl. 62-196.00R.

Anderson, J. Ross: *See*—
Omori, Masahiro; Wholey, James N.; and Anderson, J. Ross, 4,213,840, Cl. 204-192.00C.

Anderson, Joseph W., to Marine Construction & Design Co. Flow-through coalescing separator. 4,213,863, Cl. 210-108.000.

Ando, Hiroshi: *See*—
Fujita, Hisaya; Ando, Hiroshi; and Sato, Setsuo, 4,214,250, Cl. 346-145.000.

Ando, Koji, to Fujitec Co., Ltd. Elevator control system. 4,213,517, Cl. 187-29.00R.

Ando, Kunio: *See*—
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.

Andres, Rudolf; Grantz, Helmut; Abersfelder, Gunter; and Busch, Gerhard, to Daimler-Benz Aktiengesellschaft. Wind-up mechanism for the elimination of belt looseness in a safety belt system. 4,213,581, Cl. 242-107.40R.

Andrews, Jere L.: *See*—
Farrell, John W.; and Andrews, Jere L., 4,214,156, Cl. 250-231.0SE.

Antosz, Frederick J.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,052, Cl. 435-55.000.

Aoki, Teruo: *See*—
Minami, Hidehiro; and Aoki, Teruo, 4,213,430, Cl. 123-440.000.

Aoyagi, Sadayoshi: *See*—
Miura, Yoshiharu; Aoyagi, Sadayoshi; and Miyamoto, Kazuhisa, 4,213,962, Cl. 424-78.000.

Aoyama, Kensuke: *See*—
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, 4,213,926, Cl. 264-74.000.

Apotheker, David; and Krusic, Paul J., to Du Pont de Nemours, E. I., and Company. Fluoropolymer composition. 4,214,060, Cl. 525-387.000.

Aqua Star Pool Company: *See*—
Scourtes, Chris N., 4,213,210, Cl. 4-543.000.

Arcanum Corporation: *See*—
Caswell, Bruce F., 4,213,779, Cl. 75-34.000.

Arechavala, Juan M. Continually adjustable frequency antenna. 4,214,246, Cl. 343-750.000.

Arie, Yehuda: *See*—
Williams, Richard; and Arie, Yehuda, 4,213,798, Cl. 136-89.0SJ.

Arikawa, Yoshijiro: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.

Arlt, Christian; and Arlt, Gerhard. Sealing insert for the tight connection of two pipes. 4,213,619, Cl. 277-207.00A.

Arlt, Gerhard: *See*—
Arlt, Christian; and Arlt, Gerhard, 4,213,619, Cl. 277-207.00A.

Armitage, Harry J. Work cutting. 4,213,356, Cl. 82-2.00B.

Armstrong, David A., to British Steel Corporation. Profile gauging. 4,213,245, Cl. 33-174.00P.

Armstrong, George H.: *See*—
Seefried, Carl G., Jr.; Armstrong, George H.; and Van Cleve, Russell, 4,214,055, Cl. 521-137.000.

Asahi-Dow Limited: *See*—
Watanabe, Seizaburo; and Matsuki, Yutaka, 4,214,054, Cl. 521-95.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ibata, Jyoji; Fukui, Hisaaki; Yuasa, Takeo; and Katoh, Michio, 4,214,026, Cl. 428-67.000.
Ishihara, Shunichi; and Katsube, Toraichi, 4,214,057, Cl. 525-100.000.

Asawa, Charles K., to Hughes Aircraft Company. Pyroelectric IR detector with signal capacitively coupled to an output circuit. 4,214,165, Cl. 250-338.000.

Ashby, Robert M.; and Kaveggia, Frederick S. Composition and process for removing sulfur scale from interstices in petroleum bearing formations and the like to improve the flow of petroleum. 4,213,866, Cl. 252-8.55C.

Ashcroft, Robert G.: *See*—
Coster, Hans G. L.; Ashcroft, Robert G.; and Smith, John R., 4,214,203, Cl. 324-425.000.

Ashton, Harold P.: *See*—
Petruzzi, Thomas G.; Ashton, Harold P.; and Conti, Rino, 4,213,271, Cl. 47-39.000.

Asikainen, Aimo, to Asko-Upo Oy; and AGA Heating AB. Combination of a biological dry toilet and a biological waste water purifying plant. 4,213,864, Cl. 210-151.000.

Asko-Upo Oy: *See*—
Asikainen, Aimo, 4,213,864, Cl. 210-151.000.

Astle, Gail L.: *See*—
Liu, Wen-Chih; Brown, William E.; and Astle, Gail L., 4,213,966, Cl. 424-123.000.

Atkinson, James E.: *See*—
West, Wilbur C.; and Atkinson, James E., 4,213,408, Cl. 111-85.000.

Attwell, Michael C.; Massiah, Thomas F.; Vergottini, Roberto A.; and Ziegler, Peter, to Canada Packers Limited. Process for preparing high-melting chenodeoxycholic acid. 4,213,911, Cl. 260-397.100.

Aulich, Hubert; Douklias, Nikolaos; Hacker, Heinz; and Zeidler, Guenter, to Siemens Aktiengesellschaft. Light waveguide with a high tensile strength. 4,213,672, Cl. 350-96.230.

Auman, John T.: *See*—
Irwin, Clarence C.; Manz, David F.; and Auman, John T., 4,213,652, Cl. 297-478.000.

Aurell, Leif E.: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.

Australian Paper Manufacturers Limited: *See*—
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, 4,213,821, Cl. 162-72.000.

Automation Industries, Inc.: *See*—
Hall, Marcus A.; and Kutnyak, Thomas A., 4,213,811, Cl. 156-195.000.

Automobiles Peugeot: *See*—
Mauron, Gerard, 4,213,637, Cl. 280-802.000.

Avantek, Inc.: *See*—
Omori, Masahiro; Wholey, James N.; and Anderson, J. Ross, 4,213,840, Cl. 204-192.00C.

AVM Corporation: *See*—
Sheppard, William L., 4,213,595, Cl. 251-308.000.

Avnet, Incorporated: *See*—
Richmond, Thomas A., 4,214,247, Cl. 343-752.000.

Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, to Hitachi, Ltd. Process for removing nitrogen oxides from gas by ammonia. 4,213,944, Cl. 423-235.000.

Azzerri, Nazzareno; Bruno, Roberto; and Memmi, Massimo, to Centro Sperimentale Metallurgico S.p.A. Process for improving the adhesion of paint to steel sheets. 4,213,839, Cl. 204-181.00R.

B. F. Goodrich Company, The: *See*—
Lee, Yu-Sun, 4,214,061, Cl. 525-455.000.
Porter, John P., 4,213,331, Cl. 73-105.000.

B. K. Sweeney Manufacturing Co.: *See*—
Krieger, Raymond L.; Weaver, Ralph W.; and Able, Edward T., 4,213,333, Cl. 73-136.00R.

Babcock & Wilcox Company, The: *See*—
Jabsen, Felix S., 4,213,824, Cl. 176-38.000.

Badali, Joseph A., to Browning Arms Company. Box magazine follower system. 4,213,262, Cl. 42-50.000.

Bafaro, Michael P.; and Parker, James J., to Motorola, Inc. Dynamic focus for a cathode ray tube. 4,214,188, Cl. 315-382.000.

Baier, Walter P.; and Grammueller, Harald, to Siemens Aktiengesellschaft. Circuit for synchronizing a pseudo-random generator mounted at a receiver for communication transmission systems utilizing pseudo-noise phase shift keying. 4,214,209, Cl. 375-1.000.

Bailey, Thomas G. Fluid mixing devices. 4,213,711, Cl. 366-150.000.

Ballard, Paul T.: *See*—
Hill, Henry A.; Figoski, John W.; and Ballard, Paul T., 4,213,706, Cl. 356-353.000.

Balogh, Andras: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid reservoirs for master cylinders. 4,213,535, Cl. 220-20.500.

Bantick, John R.; Hardern, David N.; and Lee, Thomas B., to Fisons Limited. Basic amino acid salts of chromones. 4,213,903, Cl. 548-250.000.

Bargain, Michel; and Lefort, Marcel, to Rhone-Poulenc Industries. Ethylenic silicon compounds and thermoplastic elastomers obtained therefrom. 4,213,914, Cl. 556-419.000.

Barlow, Paul; and Jones, Kenneth R., to Jones, Kenneth Robert. Three term (PID) controllers. 4,214,300, Cl. 364-105.000.

Barnes, Donald E., to Champion International Corporation. Packaging laminate. 4,214,029, Cl. 428-200.000.

Barnes, Floyd A., Jr., to Youngstown Sheet and Tube Company. Method and apparatus for upsetting pipe. 4,213,322, Cl. 72-357.000.

Barnum, Ronald E.: *See*—
Tefft, Franklin A.; Perez, Ricardo L.; and Barnum, Ronald E., 4,213,584, Cl. 244-17.130.

Barsony, Imre: *See*—
Madec, Marcel; Espitalie, Jean; Laporte, Jean-Loup; and Barsony, Imre, 4,213,763, Cl. 23-230.0EP.

Bartha, Peter; and Tutsek, Alexander, to Refratechnik GmbH. Glass forming compound and brick made therwith. 4,213,789, Cl. 106-52.000.

Bartlett, Charles C. Adjustable lamp for furniture attachment. 4,214,294, Cl. 362-127.000.

BASF Aktiengesellschaft: *See*—
Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, 4,213,992, Cl. 424-273.00P.
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.
Datow, Joachim; Decker, Martin; Merkel, Karl; and Neumayr, Franz, 4,213,919, Cl. 260-544.00K.
Daubach, Ewald; Horn, Dieter; Hahn, Erwin; and Uhrig, Herbert, 4,213,900, Cl. 260-208.000.
Eckell, Albrecht; Matthies, Paul; Pilz, Georg; and Rotzoll, Rudi-Heinz, 4,213,884, Cl. 260-29.20N.
Hahn, Erwin; Magerkurth, Bernhard; Lach, Dietrich; and Wuertele, Lothar, 4,213,760, Cl. 8-94.170.
Kretschmer, Alfred; Ruettiger, Wilhelm; and Wuerz, Albrecht, 4,213,217, Cl. 8-151.000.
Loeffler, Hans-Peter; Adolphi, Heinrich; and Kiehs, Karl, 4,213,976, Cl. 424-224.000.
Ruske, Manfred; and Elser, Wolfgang, 4,213,757, Cl. 8-518.000.
Schoettle, Klaus; Dobler, Peter; Lewin, Helmut; and Koester, Eberhard, 4,213,222, Cl. 15-100.000.
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, 4,214,072, Cl. 528-272.000.

BASF Wyandotte Corporation: *See*—
Schweickart, Albert J.; and Mooney, Thomas F., III, 4,213,336, Cl. 73-215.000.

Basler, Gunter: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, 4,213,552, Cl. 226-170.000.

Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, to Polysius AG. Process for the production of cement in a fluidized bed. 4,213,790, Cl. 106-100.000.

Bauer, Werner R., to Robertshaw Controls Company. Reversing valve construction and parts therefor and methods of making the same. 4,213,483, Cl. 137-625.290.

Bauman, Albert J.; and Morelli, Frank A. Nondestructive testing of HEPA filters. 4,213,768, Cl. 55-97.000.

Baumann, Annegrit: *See*—
Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, 4,213,992, Cl. 424-273.00P.

Bavaveas, Tristan, to Societe Anonyme dite:EPARCO. Biological activators. 4,213,871, Cl. 252-60.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bayham, Edward L., 4,213,561, Cl. 233-14.00R.
Shim, Norm, 4,213,454, Cl. 128-214.00E.
Zissimopoulos, Nicholas, 4,214,237, Cl. 340-686.000.

Bayer Aktiengesellschaft: *See*—
Berg, Gerhard; Hohmann, Walter; Reubke, Karl-Julius; and Wunderlich, Klaus, 4,213,909, Cl. 260-371.000.
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,214,062, Cl. 525-470.000.
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,214,082, Cl. 544-189.000.
Hentze, Gunter, 4,214,117, Cl. 13-31.00R.
Moretto, Hans-Heinrich; Steinberger, Helmut; Larking, Ingrid; and Sattlegger, Hans, 4,214,066, Cl. 528-28.000.
Muders, Rolf; Leister, Heinrich; Dittmer, Helmut; and Schonhagen, Hubert, 4,213,910, Cl. 260-371.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,214,105, Cl. 568-771.000.

Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Flexible, collapsible container for blood and the like which is free of liquid-trapping folds. 4,213,561, Cl. 233-14.00R.

Baylis, Eric K.; and Pickles, Wilfred, to Ciba-Geigy Corporation. Phosphonous acid derivatives, processes for their preparation and their use in combatting microorganisms. 4,213,969, Cl. 424-177.000.

Bazin, Lucas J.; Peterson, Gary R.; and Schneider, Dennis M., to RCA Corporation. Synchronizing apparatus for remote television apparatus. 4,214,261, Cl. 358-19.000.

BBC Brown Boveri & Company Limited: *See*—
Kaufmann, Meinolph, 4,213,676, Cl. 350-336.000.
Raggenbass, Werner; and Zwar, Kurt, 4,214,177, Cl. 307-355.000.

Beacham, Harry H., to FMC Corporation. Flame resistant resin compositions. 4,213,889, Cl. 260-45.7PH.

Beaton, John M.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,052, Cl. 435-55.000.

Beattie, Willard H.: *See*—
Freund, Samuel M.; Maier, William B., II; Beattie, Willard H.; and Holland, Redus F., 4,213,836, Cl. 204-157.10R.

Bechtel International Corporation: *See*—
Grenia, James D., 4,213,653, Cl. 299-11.000.

Beck, Frederick R., to McGill Manufacturing Company, Inc. Ignition control system with safety switches. 4,213,513, Cl. 180-272.000.

Beckel, Kurt: *See*—
Brozel, Rudolf; Beckel, Kurt; and Berkhout, Jan, 4,213,330, Cl. 73-65.000.

Beckman Instruments, Inc.: *See*—
Haunold, Otto; and Greene, Malbone W., 4,213,703, Cl. 356-244.000.
Jacobson, Kenneth E.; and Gutierrez, William S., 4,214,179, Cl. 310-68.00B.

Becraft, Lloyd G.: *See*—
Sooter, Matthew C.; Becraft, Lloyd G.; and Kegler, William H., 4,213,846, Cl. 208-50.000.

Becton Dickinson & Company: *See*—
Kreutz, George D.; Scott, L. J.; and Kelly, James P., 4,213,528, Cl. 206-205.000.

Beecham Group Limited: *See*—
Hadley, Michael S.; and Watts, Eric A., 4,213,983, Cl. 424-250.000.

Beecham, Inc.: *See*—
Curtis, Stephen N.; and Bhargava, Hridaya N., 4,213,961, Cl. 424-54.000.

Behlen, James C., Jr.: *See*—
Parker, Edward J.; and Behlen, James C., Jr., 4,214,269, Cl. 358-140.000.

Belknap, Raymond R.: *See*—
Guebert, Gerald E.; and Belknap, Raymond R., 4,213,492, Cl. 160-124.000.

Bell, Frederick K.; and Tuss, John J., to Bendix Corporation, The. Coordinate measuring machine having a failsafe protection system. 4,213,244, Cl. 33-1.00M.

Bell Telephone Laboratories, Incorporated: *See*—
Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., 4,213,698, Cl. 355-77.000.
Johnston, Wilbur D., Jr., 4,213,801, Cl. 148-33.300.
Young, William C., 4,213,932, Cl. 264-236.000.

Bellos, Thomas J.; and Davis, James E., to Petrolite Corporation. Use of phosphorylated oxyalkylated polyols in conjunction with sulfite and bisulfite oxygen scavengers. 4,213,934, Cl. 422-15.000.

Beloit Corporation: *See*—
Wittig, Carl E.; and Vonderau, Raymond C., 4,213,823, Cl. 162-380.000.

Bemis Manufacturing Company: *See*—
Bemis, Richard A.; and Rummele, John E., 4,213,211, Cl. 4-239.000.

Bemis, Richard A.; and Rummele, John E., to Bemis Manufacturing Company. Toilet seat elevator device. 4,213,211, Cl. 4-239.000.

Bendix Corporation, The: *See*—
Bell, Frederick K.; and Tuss, John J., 4,213,244, Cl. 33-1.00M.
Carp, Ralph W.; and Groff, William R., 4,214,236, Cl. 340-642.000.
Carp, Ralph W., 4,214,308, Cl. 364-431.000.
Peterson, William A., Jr.; and Marchak, Roman O., 4,214,307, Cl. 364-431.000.
Rogers, Francis R.; and Eastman, James M., 4,213,741, Cl. 417-79.000.

Benjamin, Benjamin C., to Schmelzer Corporation. Valve control mechanism. 4,213,481, Cl. 137-596.180.

Bennett, Joe B., to Owens-Corning Fiberglas Corporation. Filament wound pipe coupling. 4,213,641, Cl. 285-369.000.

Benthos, Inc.: *See*—
Raymond, Samuel O.; and Hayward, Gary G., 4,213,329, Cl. 73-52.000.

Berezin, Evgeny N.: *See*—
Vydrin, Vladimir N.; Berezin, Evgeny N.; and Dremin, Vladimir G., 4,213,320, Cl. 72-189.000.

Berg, Gerhard; Hohmann, Walter; Reubke, Karl-Julius; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 1-amino-4-bromoanthraquinone-2-sulfonic acid II. 4,213,909, Cl. 260-371.000.

Bergen-Brunswig Corporation: *See*—
Halasz, Peter R., 4,213,598, Cl. 206-45.140.

Bergner, Robert L.: *See*—
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,213,802, Cl. 148-101.000.

Berkhout, Jan: *See*—
Brozel, Rudolf; Beckel, Kurt; and Berkhout, Jan, 4,213,330, Cl. 73-65.000.

Bernelin, Daniel: *See*—
Meyer, Jacques; and Bernelin, Daniel, 4,214,040, Cl. 428-458.000.

Best & Donovan: *See*—
Wikoff, Mark W., 4,213,334, Cl. 73-144.000.

Bexford Limited: *See*—
Cook, Alan H., 4,213,783, Cl. 430-533.000.

Beyer, Rudiger: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Beziac, Gilbert F. A.: *See*—
Euler, August H. L.; and Beziac, Gilbert F. A., 4,213,739, Cl. 416-226.000.

Bezrukov, Sergei V.: *See—*
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,213,834, Cl. 204-129.250.

Bhargava, Hridaya N.: *See—*
Curtis, Stephen N.; and Bhargava, Hridaya N., 4,213,961, Cl. 424-54.000.

Bhatia, Harsaran S.: *See—*
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,214,315, Cl. 357-44.000.

Bindra, Jaajit S., to Pfizer Inc. Prostaglandin intermediates. 4,213,907, Cl. 260-343.30P.

Bindra, Jaajit S.: *See—*
Corey, Elias J.; Bindra, Jaajit S.; and Schaaf, Thomas K., 4,214,099, Cl. 560-256.000.

Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, to Bayer Aktiengesellschaft. Polycarbonate films of low flammability and improved stress crack resistance. 4,214,062, Cl. 525-470.000.

Biondetti, Mario; and Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,213,232, Cl. 29-116.0AD.

Biskis, Kestutis, to International Harvester Company. Variable flow rate control with mechanical override for closed center valve. 4,213,300, Cl. 60-420.000.

Bitely, Clarence J., Jr.; Dromgold, Luther D.; and Murray, William S., Jr., to Witco Chemical Corporation. Galvanic corrosion prevention coupling. 4,213,868, Cl. 252-11.000.

Blackwell, Jennings P., to Phillips Petroleum Company. Coating process for corrosion-inhibiting poly(arylene sulfide) coating compositions. 4,214,021, Cl. 427-385.0OR.

Blake, Larry V.; Womeldorph, Donald E., Jr.; Surber, Oliver M.; and James, John P., to Phillips Petroleum Company. Method and apparatus for classifying solids and transporting solids-laden fluid. 4,213,856, Cl. 209-250.000.

Blakely, Robert F.: *See—*
Adams, William M.; Blakely, Robert F.; Ellis, Charles R.; and Mead, Judson, 4,214,238, Cl. 340-690.000.

Blanc, Jean-Pierre; and Meiller, Francois, to Rhone-Poulenc Industries. Hardening catalysts and alkali metal silicate compositions containing same. 4,213,785, Cl. 106-38.350.

Blay, George A., to Celanese Corporation. Prevention of electrode fouling. 4,214,050, Cl. 435-29.000.

Blaylock, Tommey J. Clutch throw-out bearing plate. 4,213,522, Cl. 192-98.000.

Blind, Karl; and Klotz, Arthur, to Filterwerk Mann & Hummel GmbH. Knee lever lock for air filter covers and the like. 4,213,643, Cl. 292-247.000.

Blish, Richard C., II: *See—*
Lemons, Kyle E.; Blish, Richard C., II; and Reimer, Jan D., 4,213,818, Cl. 156-643.000.

Block, Duncan G.: *See—*
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,800, Cl. 148-2.000.
Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,799, Cl. 148-2.000.

Blom, Rolf: *See—*
Fak, Viiveke; Ingemarsson, Ingemar B.; Blom, Rolf; Forchheimer, Robert; and Hellberg, Bjorn I., 4,214,230, Cl. 340-149.00A.

Boardman, Alfred H., to American Can Company. Can end closure. 4,213,538, Cl. 220-268.000.

Boberg, Anders; Larsson, Bernt; and Lundh, Folke, to Aktiebolaget Bofors. Bonding agent for sheet-formed fibre products. 4,213,885, Cl. 260-29.6TA.

Boberg, Nils G. E.; and Carlsson, Per-Olov A. V., to Gambro AB. Supporting net. 4,213,858, Cl. 210-23.00R.

Bocksruker, Ronald W.: *See—*
McCaney, Carlos P.; and Bocksruker, Ronald W., 4,213,387, Cl. 100-245.000.

Bodor, Nicholas S.; and Sloan, Kenneth B., to INTERx Research Corporation. Anti-acne and anti-seborrhea prodrug derivatives of progesterone. 4,213,978, Cl. 424-241.000.

Boegeman, Dwight E.: *See—*
Spiess, Frederick N.; Boegeman, Dwight E.; Pavlicek, Frank V.; and Lowenstein, Carl D., 4,214,314, Cl. 367-2.000.

Boehm, Kurt: *See—*
Keznickl, Eduard; and Boehm, Kurt, 4,214,268, Cl. 358-127.000.

Boehringer Ingelheim GmbH: *See—*
Dirheimer, Guy; and Louisot, Pierre, 4,213,970, Cl. 424-180.000.
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, 4,214,001, Cl. 424-300.000.
Schmidt, Gunther; and Leitold, Matyas, 4,213,984, Cl. 424-250.000.
Schmidt, Gunther; and Leitold, Matyas, 4,213,985, Cl. 424-250.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, 4,213,995, Cl. 424-273.00R.

Boeing Company, The: *See—*
Murphy, Patrick, 4,213,585, Cl. 244-54.000.
Roeseler, William G.; Warner, Gary J.; and Odell, Richard B., 4,213,587, Cl. 244-213.000.

Bogert, Clayton; Alexander, John D.; and Krautheim, Leonard, to Lever Manufacturing Co. Fluid jet cutter with confined passageway for fluid disposal. 4,213,359, Cl. 82-47.000.

Bohner, Beat: *See—*
Schurter, Rolf; Rempfler, Hermann; and Bohner, Beat, 4,213,774, Cl. 71-94.000.

Bohringer, Walter, to RCA Corporation. Regulated deflection circuit. 4,214,189, Cl. 315-408.000.

Bold, Jorg: *See—*
Knuaf, Alfons; Bold, Jorg; and Franke, Siegfried, 4,214,027, Cl. 428-113.000.

Bonaddio, Robert M., to PPG Industries, Inc. Method of and apparatus for initiating a damage-free score in a refractory material. 4,213,550, Cl. 225-2.000.

Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., to M & W Gear Company. Rotor-stator configuration for water brake dynamometer. 4,213,332, Cl. 73-134.000.

Bonori, Maurizio, to Franconi, Cafiero, a part interest. Slow square wave modulated gyromagnetic resonance spectrometer for automatic analysis and process control. 4,214,202, Cl. 324-313.000.

Boogers, Wilhelmus P. L., to B.V. Arenco P.M.B. Method and device for dividing tobacco leaves or the like into pieces. 4,213,468, Cl. 131-145.000.

Boomer, Merton E. Solvent immersion extractor. 4,213,941, Cl. 422-267.000.

Bosch-Siemens Hausgerate GmbH: *See—*
Fleischhauer, Werner, 4,214,148, Cl. 219-308.000.

Bosing, Hans: *See—*
Rossi, Guglielmo; and Bosing, Hans, 4,214,136, Cl. 200-67.0DA.

Bottger, Paul E. K. Medical multi-purpose instrument. 4,213,456, Cl. 128-218.00P.

Boultinghouse, Harold D., to Phillips Petroleum Company. Process for preparing crosslapped film structures. 4,213,812, Cl. 156-226.000.

Bourne, Alan J.: *See—*
Pope, George A.; and Bourne, Alan J., 4,213,491, Cl. 152-330.00L.

Bourne, William R.: *See—*
Poe, L. Richard; and Bourne, William R., 4,213,642, Cl. 292-241.000.

Bovee, David B.; and Thigpen, Ben B., to Western Geophysical Co. of America. Method and apparatus for demultiplexing multiplexed seismic data. 4,214,128, Cl. 370-112.000.

Bowles, Colin M., to Westinghouse Brake and Signal Co. Ltd. Fluidically operated railway switch machine. 4,213,588, Cl. 246-259.000.

Boyce, Jay, to Jay Boyce & Associates. Energy controller for conversion from a direct current source to a variable frequency load. 4,214,196, Cl. 318-811.000.

Brademeyer, David L., to General Motors Corporation. Master cylinder assembly and brake system incorporating same. 4,213,655, Cl. 303-6.00C.

Bradley, Phecell. Electromagnetic augmentation of internal combustion engines. 4,213,428, Cl. 123-46.00E.

Braginetz, Paul A.; and Floyd, Paul D., to Virginia Panel Corporation. Mechanism for positioning a test adapter in operative relationship with a receiver. 4,213,666, Cl. 339-75.00M.

Brakebill, Harold G., to Robertshaw Controls Company. Method of making a pilot operated valve positioner. 4,213,233, Cl. 29-157.10R.

Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., to Givaudan Corporation; and Hoffmann-La Roche Inc. Preservation of aqueous systems with 2-chloro-3-oxobutyramide derivatives. 4,214,002, Cl. 424-300.000.

Braun Aktiengesellschaft: *See—*
Hoffmann, Karl-Heinz, 4,214,149, Cl. 219-370.000.

Braun, Charles H.: *See—*
Peffer, Robert M.; and Braun, Charles H., 4,213,603, Cl. 271-229.000.

Breashears, James C.: *See—*
Cowles, Clarence W.; Breashears, James C.; and Mungons, Edwin M., 4,213,729, Cl. 414-462.000.

Breda Termomeccanica S.p.A.: *See—*
Straffi, Franco, 4,213,499, Cl. 165-162.000.

Breed, David S. Ball rotor safety and arming delay device. 4,213,395, Cl. 102-236.000.

Breeze, Alan G. Light sources. 4,214,185, Cl. 315-86.000.

Brenner, Charles H., to Motorola, Inc. Spin processing active optical fuze. 4,213,394, Cl. 102-213.000.

Bresie, Don A.; Fowler, Donald W.; and Burns, Jack M., to Texas Gas Transport Company. Method and system for producing and transporting natural gas. 4,213,476, Cl. 137-2.000.

Bridgestone Tire Company: *See—*
Imamura, Takaaki; Kawagoe, Takahiro; Chikaraishi, Toshio; and Nyomura, Takashi, 4,214,058, Cl. 525-348.000.

Bright, Robert G., to Draftex Development AG. Channel-shaped sealing, trimming and guiding strips. 4,214,036, Cl. 428-358.000.

Bristowe, William W.; Ford, Ernest C., Jr.; and Reed, Weldon N., to ICI Americas Inc. Vinyl ester urethanes. 4,213,837, Cl. 204-159.190.

British Aircraft Corporation: *See—*
Guest, Ashley W., 4,214,205, Cl. 455-20.000.

British-American Tobacco Company Limited: *See—*
Horsewell, Henry G.; Green, John D.; Luke, John A.; and Harrison, Raymond J., 4,213,470, Cl. 131-261.00B.

British Steel Corporation: *See—*
Armstrong, David A., 4,213,245, Cl. 33-174.00P.
Middlemiss, Andrew; and Malkani, Dalip T., 4,213,231, Cl. 29-18.000.

Brodasky, Thomas F., to Upjohn Company, The. Sample supply device. 4,213,326, Cl. 73-23.100.

Broddevall, Bengt G., to Uddeholms Aktiebolag. Treatment of effluents in a chlorine based pulp bleaching plant. 4,213,820, Cl. 162-29.000.

Brodowski, Walter; and Wallrabenstein, Michael, to Akzona Incorporated. Preparation of terephthaloyl-terephthal/oxal copolyhydrazide containing zinc compound. 4,213,890, Cl. 260-45.75W.

Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, to BASF Aktiengesellschaft. Manufacture of acicular, ferrimagnetic iron oxide. 4,213,959, Cl. 423-634.000.

Bromer, Gunter; Gose, Horst; Hoffmann, Klaus-Rudiger; and Seeliger, Christian, to Siemens Aktiengesellschaft. Path control apparatus for the computer directed control of a numerically controlled machine tool. 4,214,192, Cl. 318-573.000.

Brouthers, Paul E., to D.W.A. Associates, Inc. Firearm trigger guard assembly. 4,213,263, Cl. 42-59.000.

Brown, Donald J., to Knox Manufacturing Co. Overlay device for use with an illuminated transparency viewer. 4,213,260, Cl. 40-158.00B.

Brown, Paul R.: *See*—
De George, Robert P.; Brown, Paul R.; and Carbone, Victor T., 4,213,733, Cl. 414-751.000.

Brown, Timothy W., to GTE Products Corporation. Circuit for indicating antenna signal input level on television receiver screen. 4,214,273, Cl. 358-188.000.

Brown, William E.: *See*—
Liu, Wen-Chih; Brown, William E.; and Astle, Gail L., 4,213,966, Cl. 424-123.000.

Browning Arms Company: *See*—
Badali, Joseph A., 4,213,262, Cl. 42-50.000.

Brozel, Rudolf; Beckel, Kurt; and Berkhout, Jan. Machine for measuring the moments of inertia. 4,213,330, Cl. 73-65.000.

Bruno, Roberto: *See*—
Azzerri, Nazzareno; Bruno, Roberto; and Memmi, Massimo, 4,213,839, Cl. 204-181.00R.

Brunswick Corporation: *See*—
Floeter, Larry A., 4,213,353, Cl. 74-878.000.

Bryan, Henry A.; Martin, Walter H.; and Konves, Richard L. Powder dispenser. 4,213,423, Cl. 119-86.000.

Bryant, Nelson; and Hoppe, Rudy, to Powers Manufacturing, Inc. Glass inspection method and apparatus. 4,213,702, Cl. 356-239.000.

Bryson, John D., to Will Ross, Inc. Environmental control unit and method. 4,213,923, Cl. 261-120.000.

Buckler, Robert T., to Miles Laboratories, Inc. Diphenylhydantoin immunogen conjugates. 4,213,894, Cl. 260-112.50R.

Buckler, Robert T., to Miles Laboratories, Inc. Diphenylhydantoin antibodies. 4,213,964, Cl. 424-85.000.

Budzan, Bogdan P.: *See*—
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.

Bulova Watch Company, Inc.: *See*—
Dolezal, Zdenek; and Hof, Urs J., 4,213,292, Cl. 368-204.000.

Bureika, Mindaugas N.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.

Burian, Paul D.; and Sempliner, Arthur T., to Clairol, Inc. Manicuring unit. 4,213,471, Cl. 132-73.600.

Burnett, John S. Support device. 4,213,213, Cl. 5-450.000.

Burns, Jack M.: *See*—
Bresie, Don A.; Fowler, Donald W.; and Burns, Jack M., 4,213,476, Cl. 137-2.000.

Burns, Richard H.; and Crabtree, Kenneth, to Singer Company, The. Method and apparatus for sensing the position of a writing laser beam. 4,213,704, Cl. 356-349.000.

Burroughs Corporation: *See*—
Lin, An-Chung R., 4,213,717, Cl. 401-18.000.
Ragle, Herbert U.; and DeMoss, Dean, 4,214,286, Cl. 360-99.000.
Stromsta, Roger R.; Nathanson, Marshall R.; and Morton, Dennis S., 4,214,287, Cl. 360-103.000.

Burson, Bob O., to R. E. Phelon Company, Inc. Capacitor discharge ignition and alternator auxiliary power system. 4,213,436, Cl. 123-599.000.

Burton, Charles A., to United States of America, Navy. Radioactive source manipulator and stowage device. 4,213,646, Cl. 294-86.00A.

Burton, Charles G., to Chisholm-Ryder Company, Inc. Bean snipper. 4,213,383, Cl. 99-636.000.

Busch, Gerhard: *See*—
Andres, Rudolf; Grantz, Helmut; Abersfelder, Gunter; and Busch, Gerhard, 4,213,581, Cl. 242-107.40R.

Bush, Eric L.: *See*—
Sterling, Henley F.; Bush, Eric L.; and McManus, Stephen J., 4,214,293, Cl. 361-433.000.

Bush, Terry D.; and Denen, D. Joseph, to Floyd Bell Associates Inc. Electronic audio signalling device for telephones. 4,214,131, Cl. 179-84.00T.

Buss, Kenton A., to Igloo Corporation. Thermal container with quick-release lid-mounted flask. 4,213,310, Cl. 62-457.000.

B.V. Arenco P.M.B.: *See*—
Boogers, Wilhelmus P. L., 4,213,468, Cl. 131-145.000.

Bye, Ashley D., to Imperial Chemical Industries Limited. Transition metal composition and process. 4,213,878, Cl. 252-429.00B.

C. L. Frost & Son, Inc.: *See*—
Frost, Charles C.; and Weis, Siegfried K., 4,213,523, Cl. 193-37.000.

C. Mayo, Inc.: *See*—
Mayo, Carlos, 4,213,445, Cl. 126-143.000.

Caccavale, Patrick W., to Sherri Cup, Inc. Container lid assembly. 4,213,537, Cl. 220-215.000.

Cadillac Gage Company: *See*—
Jackson, Theodore A., 4,213,376, Cl. 89-34.000.

Cahill, James P.: *See*—
Silverman, John H.; and Cahill, James P., 4,213,284, Cl. 53-74.000.

Cain Encoder Company: *See*—
Hess, Donald T., 4,214,152, Cl. 235-92.0EC.

Cain, George R., to Koppers Company, Inc. One-spot coke quench car coke distribution system. 4,213,489, Cl. 141-70.000.

Calderon, Albert. Method and apparatus for quenching coke. 4,213,827, Cl. 201-39.000.

Calderon, Albert. Method and apparatus for quenching coke. 4,213,828, Cl. 201-39.000.

California Processing Machinery: *See*—
Meissner, Konrad E., 4,213,382, Cl. 99-486.000.

Calvert, Rodney K.; Scott, Dale K.; and Fishback, Alton J., to Mead Corporation, The. Machine for applying an article carrier to a plurality of bottles. 4,213,283, Cl. 53-48.000.

Cambio, Orlando D., to Respiratory Care, Inc. Method of making a blow molded container having an insert molded in situ. 4,213,933, Cl. 264-515.000.

Cameron, Gordon M.; Jones, Frederick W. S.; and Nolan, Peter D., to Canadian Industries Limited. Production of sulphur trioxide, sulphuric acid and oleum. 4,213,958, Cl. 423-522.000.

Campbell, Barry D.: *See*—
Graham, Robert H.; and Campbell, Barry D., 4,213,526, Cl. 198-400.000.

Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Method of treatment. 4,214,003, Cl. 424-301.000.

Campbell Soup Company: *See*—
Helmer, Warren D.; and Small, Robert E., 4,213,229, Cl. 17-46.000.

Canada Packers Limited: *See*—
Attwell, Michael C.; Massiah, Thomas F.; Vergottini, Roberto A.; and Ziegler, Peter, 4,213,911, Cl. 260-397.100.

Canadian Industries Limited: *See*—
Cameron, Gordon M.; Jones, Frederick W. S.; and Nolan, Peter D., 4,213,958, Cl. 423-522.000.

Canon Kabushiki Kaisha: *See*—
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, 4,214,249, Cl. 346-76.00L.
Mikajiri, Kazukichi, 4,213,688, Cl. 354-23.00D.
Momiyama, Kikuo, 4,213,674, Cl. 350-227.000.
Sato, Hideaki, 4,214,154, Cl. 250-201.000.
Sato, Tadashi, 4,213,604, Cl. 271-233.000.
Sugiura, Muneharu; Minami, Setsuo; and Miyamoto, Koichi, 4,213,690, Cl. 355-8.000.

Carbone, Victor T.: *See*—
De George, Robert P.; Brown, Paul R.; and Carbone, Victor T., 4,213,733, Cl. 414-751.000.

Carbonnel, Henri, to Novatome. Process and apparatus for low pressure casting. 4,213,494, Cl. 164-4.000.

Carborundum Company, The: *See*—
Owens, Dean P., 4,213,883, Cl. 252-478.000.

Carden, Joseph A., Jr.: *See*—
Ward, Robert R.; Chang, Richard C.; Danos, James C.; and Carden, Joseph A., Jr., 4,214,020, Cl. 427-296.000.

Cardenas, Ricardo L.; and Carlin, Joseph T., to Texaco Inc. Oil recovery process: injection of fatty alcohol followed by soap. 4,213,500, Cl. 166-273.000.

Carlin, Joseph T.: *See*—
Cardenas, Ricardo L.; and Carlin, Joseph T., 4,213,500, Cl. 166-273.000.

Carlock, John T., to Conoco, Inc. Polymer bound (pentahaptocyclopentadienyl)biscarbonyl rhodium hydroformylation catalyst. 4,214,109, Cl. 568-909.000.

Carlsson, Per-Olov A. V.: *See*—
Boberg, Nils G. E.; and Carlsson, Per-Olov A. V., 4,213,858, Cl. 210-23.00R.

Carmichael, Leland E., to Cornell Research Foundation, Inc. Small-plaque variant canine herpesvirus vaccine. 4,213,965, Cl. 424-89.000.

Carney, Ronald E.; and Hanessian, Stephen, to Abbott Laboratories. 1-N-Substituted derivatives of seldomycin factor 5. 4,214,077, Cl. 536-17.00R.

Carney, Ronald E., to Abbott Laboratories. Fortimicins AM and AP. 4,214,080, Cl. 536-17.00R.

Carp, Ralph W.; and Groff, William R., to Bendix Corporation, The. Driver circuit for an electrical load with capability for detecting a short in the load. 4,214,236, Cl. 340-642.000.

Carp, Ralph W., to Bendix Corporation, The. Closed loop sensor condition detector. 4,214,308, Cl. 364-431.000.

Carr, John B.: *See*—
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,998, Cl. 424-285.000.
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,999, Cl. 424-285.000.

Carrico, Robert J.; and Johnson, Richard D., to Miles Laboratories, Inc. Flavin adenine dinucleotide-labeled conjugates for use in specific binding assays. 4,213,893, Cl. 260-112.50R.

Carrier Corporation: *See*—
Leonard, Louis H., 4,214,170, Cl. 290-1.00R.

Carson, Andrew B., Jr., to General Electric Company. Ribbon stripping mechanism. 4,213,716, Cl. 400-196.100.

Carson, Don B., to UOP Inc. Isoparaffin-olefin alkylation utilizing evaporative cooling in a reactor-depropanizer. 4,214,114, Cl. 585-715.000.

Carson, John R., to McNeilab, Inc. Preparation of 5-aroyl-1-loweralkyl-pyrrole-2-acetic acid salts. 4,213,905, Cl. 260-326.470.

Casciani, Ralph A.; Wilbern, Wilmer L.; Mangan, William E.; and Franson, Paul D., to Union Carbide Corporation. Computerized process and apparatus for use with a submerged arc electric furnace to produce metallurgical products. 4,213,955, Cl. 423-442.000.

Casselbrant, Sven G., to Kockums Industri AB. Method of making structural chipboard wood beam. 4,213,928, Cl. 264-113.000.

Cassidy, Edward L., Sr.: *See*—
Safrit, Sam C.; Cassidy, Edward L., Sr.; Cothran, William B.; and Farrell, Roscoe M., 4,213,312, Cl. 66-177.000.

Caswell, Bruce F., to Arcanum Corporation. Treatment of steel mill waste materials. 4,213,779, Cl. 75-34.000.

Caterpillar Tractor Co.: *See*—
Habiger, Cyril W., 4,213,484, Cl. 137-636.100.
Lingenfelser, Daniel J., 4,213,592, Cl. 248-313.000.
Papasideris, Stamos I., 4,214,227, Cl. 340-52.00F.

Cattorini, Joseph F.; Park, Thomas R.; and Martin, John K., to Documation Incorporated. Printer elevator control mechanism. 4,213,601, Cl. 270-61.00F.

Cauwet, Daniele: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,213,960, Cl. 424-47.000.

Caverly, Brian L.: *See*—
Ainger, George E.; and Caverly, Brian L., 4,214,012, Cl. 426-607.000.

Cavil, David T.; and McAuliffe, Gerald N., to Outboard Marine Corporation. Direct current motor control with protective solenoid latching. 4,214,288, Cl. 361-6.000.

CBS Inc.: *See*—
Kaiser, Arthur, 4,214,263, Cl. 358-22.000.

Celanese Corporation: *See*—
Blay, George A., 4,214,050, Cl. 435-29.000.

Celotex Corporation, The: *See*—
Funk, Smith A.; Klasen, Charles J.; and Vilmanis, Ilmars, 4,213,487, Cl. 138-149.000.

Centro Sperimentale Metallurgico S.p.A.: *See*—
Azzerri, Nazzareno; Bruno, Roberto; and Memmi, Massimo, 4,213,839, Cl. 204-181.00R.
Marianeschi, Edmondo; and Marini, Paolo, 4,213,792, Cl. 106-286.600.

Ceram-Dent, Inc.: *See*—
Rose, Stanley E., 4,213,495, Cl. 164-34.000.

Chamberlain, Frederick R.: *See*—
United States of America, National Aeronautics and Space Administration; and Chamberlain, Frederick R., 4,213,684, Cl. 354-118.000.

Chamberlain Manufacturing Corp.: *See*—
Queen, Daniel L., 4,214,220, Cl. 335-153.000.

Champion International Corporation: *See*—
Barnes, Donald E., 4,214,029, Cl. 428-200.000.
Fremont, Henry A.; and Hedrick, Edward F., 4,213,947, Cl. 423-245.000.

Chan, John Y., to Fairchild Camera and Instrument Corporation. High-performance address buffer for random-access memory. 4,214,175, Cl. 307-264.000.

Chandler Evans Inc.: *See*—
Grennan, Charles W., 4,213,735, Cl. 415-21.000.

Chang, Clarence D.; and Morgan, Norman J., to Mobil Oil Corporation. Hydration of olefins using zeolite catalysts. 4,214,107, Cl. 568-897.000.

Chang, David T. L., to Recortec, Inc. Color video tape recorder/reproducer with chrome corrector. 4,214,259, Cl. 358-8.000.

Chang, Pei K., to Stauffer Chemical Company. Replacement of egg albumen in food compositions. 4,214,009, Cl. 426-558.000.

Chang, Richard C.: *See*—
Ward, Robert R.; Chang, Richard C.; Danos, James C.; and Carden, Joseph A., Jr., 4,214,020, Cl. 427-296.000.

Charneski, Mitchell D.; Kelley, James K.; and Gazdecki, Frank J. Electrical joint compound. 4,214,121, Cl. 174-84.00C.

Chastain, Dave, Jr.: *See*—
Crews, Harold R.; Chastain, Dave, Jr.; and Ledis, Stephen L., 4,213,876, Cl. 252-408.000.

Check, Frank T., Jr.; and Sansone, Ronald P., to Pitney Bowes, Inc. Apparatus and method for correcting imperfection in a polygon used for laser scanning. 4,214,157, Cl. 250-236.000.

Chemap AG: *See*—
Muller, Hans; and Sotirianos, Konstantin, 4,213,861, Cl. 210-82.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Zaar, Wolfgang, 4,214,108, Cl. 585-23.000.

Chen, Nai Y.; and Wang, Ikai, to Mobil Oil Corporation. Catalytic dewaxing of lubes in reactor fractionator. 4,213,847, Cl. 208-111.000.

Chen, Tsang J., to Eastman Kódak Company. Photographic elements having hydrophilic colloid layers containing hydrophobic addenda uniformly loaded in latex polymer particles. 4,214,047, Cl. 430-448.000.

Cheng, Sheng-Hsiung. Oil-water interfacial detector. 4,213,340, Cl. 73-304.00R.

Chevet, Robert; and Lenfant, Pierre, to Compagnie Industrielle des Piles Electriques "CIPEL". Air-depolarized cell. 4,214,044, Cl. 429-27.000.

Chevron Research Company: *See*—
Masada, Gary M., 4,213,845, Cl. 208-19.000.
Pyle, Walter R., 4,213,488, Cl. 141-1.000.
Wheeler, Ronald E.; and King, William F., 4,213,973, Cl. 424-200.000.

Chien, Loring C., to Dresser Industries, Inc. Oilfield pump stroke monitor. 4,213,740, Cl. 417-63.000.

Chikaraishi, Toshio: *See*—
Imamura, Takaaki; Kawagoe, Takahiro; Chikaraishi, Toshio; and Nyomura, Takashi, 4,214,058, Cl. 525-348.000.

Chimura, Kozo: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,214,134, Cl. 200-37.00R.

Chisholm-Ryder Company, Inc.: *See*—
Burton, Charles G., 4,213,383, Cl. 99-636.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.

Chukhanov, Zinovy F.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.

Church, Peter K., to Leisure Products Corporation. Water based window, glass and chrome cleaner composition. 4,213,873, Cl. 252-174.210.

Ciba-Geigy Corporation: *See*—
Abeler, Gerd; and Maul, Rudolf, 4,214,088, Cl. 546-321.000.
Baylis, Eric K.; and Pickles, Wilfred, 4,213,969, Cl. 424-177.000.
Eckhardt, Wolfgang; Hubele, Adolf; and Kunz, Walter, 4,214,005, Cl. 424-309.000.
Fah, Hansjakob, 4,214,086, Cl. 546-290.000.
Frick, Willy; and Hubele, Adolf, 4,213,990, Cl. 424-269.000.
Gosteli, Jacques, 4,213,920, Cl. 568-424.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,213,993, Cl. 424-273.00B.
Maier, Ludwig, 4,213,922, Cl. 260-958.000.
Reinehr, Dieter, 4,213,901, Cl. 260-239.0BE.
Schurter, Rolf; Rempfler, Hermann; and Bohner, Beat, 4,213,774, Cl. 71-94.000.
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,213,980, Cl. 424-246.000.

Citizen Watch Co., Ltd.: *See*—
Mabuchi, Hiroshi; and Yabe, Isao, 4,213,293, Cl. 368-152.000.

Claeson, Karl G.: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.

Clairol, Inc: *See*—
Burian, Paul D.; and Sempliner, Arthur T., 4,213,471, Cl. 132-73.600.

Clapp, Roy A. Electromagnetically actuated shutter mechanism for cameras. 4,213,689, Cl. 354-234.000.

Clarke, Robert L.; and Daum, Sol J., to Sterling Drug Inc. Ethanopyrrolo[1,2-b]isoquinolines. 4,214,084, Cl. 546-72.000.

Claudius Peters AG: *See*—
Knorr, Gunter, 4,213,287, Cl. 53-573.000.

Claypool, James P., to Claypool, James P.; and Trombley, James E. Breech locking mechanism. 4,213,261, Cl. 42-16.000.

Clifton, John D.; and Titow, Victor W., to Clifton, John David. Novel mesh fabric and wig and hair-piece made therefrom. 4,214,033, Cl. 428-255.000.

Clifton, John David: *See*—
Clifton, John D.; and Titow, Victor W., 4,214,033, Cl. 428-255.000.

CMI Corporation: *See*—
Swisher, George W., Jr.; and Steele, Thomas L., 4,213,719, Cl. 404-84.000.

Coda, Alfred. Wall-mounted displays. 4,213,259, Cl. 40-152.100.

Coffen, David L.: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,214,002, Cl. 424-300.000.

Cogas Development Company: *See*—
Eddinger, Ralph T.; and Friedman, Louis D., 4,213,826, Cl. 201-31.000.

Coha, Thomas F.; and Owen, Marvin L., to General Motors Corporation. Antirattle structure for a transmission ratio indicator assembly. 4,213,415, Cl. 116-28.100.

Coldren, Kenneth M.: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., 4,213,332, Cl. 73-134.000.

Colin, Jean-Marie H., to International Standard Electric Corporation. Method and apparatus for eliminating multiple-time echoes in pulse Doppler radars. 4,214,242, Cl. 343-7.700.

Colt, John Z.: *See*—
Thompson, Leo M.; Colt, John Z.; and Szpakowski, Robert J., 4,213,545, Cl. 222-386.500.

Colvin, David S. Adjustable socket. 4,213,355, Cl. 81-128.000.

Combustion Engineering, Inc.: *See*—
Kochey, Edward L., 4,213,402, Cl. 110-171.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Huppatz, John L., 4,214,090, Cl. 548-377.000.

Compagnie Francaise de Raffinage: *See*—
Engelhard, Philippe; Legendre, Michel; Paris, Guy; and Szabo, Georges, 4,213,849, Cl. 208-139.000.

Compagnie Francaise des Petroles: *See*—
Minkiewicz, Andre E.; and Poirier, Norbert, 4,213,555, Cl. 228-29.000.

Compagnie Industrielle des Piles Electriques "CIPEL": *See*—
Chevet, Robert; and Lenfant, Pierre, 4,214,044, Cl. 429-27.000.

Computer Ribbon Systems, Inc.: *See*—
Nicholson, Albert N., 4,213,419, Cl. 118-670.000.
Congoleum Corporation: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,214,028, Cl. 428-159.000.
Conner, Edmond E.; and Wentz, Edward C., to Westinghouse Electric Corp. Current transformer. 4,214,199, Cl. 323-6.000.
Conner, William R., Jr., to Stahl-Urban Company. Method of and apparatus for processing parts of garments, such as collars. 4,213,547, Cl. 223-2.000.
Conoco, Inc.: *See*—
Carlock, John T., 4,214,109, Cl. 568-909.000.
Sooter, Matthew C.; Becraft, Lloyd G.; and Kegler, William H., 4,213,846, Cl. 208-50.000.
Whitfill, Donald L., 4,213,762, Cl. 23-230.00R.
Consumers Glass Company Limited: *See*—
Mancini, Derek V., 4,213,285, Cl. 53-137.000.
Contact Communication Corporation: *See*—
Mellen, Arthur J.; and Reitlinger, Adolf, 4,214,215, Cl. 330-277.000.
Conti, Rino: *See*—
Petruzzi, Thomas G.; Ashton, Harold P.; and Conti, Rino, 4,213,271, Cl. 47-39.000.
Continental Group, Inc., The: *See*—
Fernandez, Luis, 4,213,751, Cl. 425-566.000.
Cook, Alan H., to Bexford Limited. Photographic film subbing layer comprising vinylidene chloride and itaconic acid or ester copolymer. 4,213,783, Cl. 430-533.000.
Cooper, Frank W., Jr., to Westinghouse Electric Corp. Apparatus for remotely repairing tubes in a steam generator. 4,213,732, Cl. 414-728.000.
Cooper, Robert N., to A. B. Dick Company. Sludge resistant liquid developer for electrostatic images containing a metal-dithiooxamide pigment or coating. 4,213,872, Cl. 430-114.000.
Copolymer Rubber & Chemical Corporation: *See*—
Karg, Rudolph F.; and Gros, Harold J., 4,213,888, Cl. 260-33.6AQ.
Corbett, Constance R., to Stauffer Chemical Company. Replacement of whole egg in baked custard. 4,214,010, Cl. 426-573.000.
Corey, Elias J.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. Intermediates for synthesis of precursors for prostaglandins. 4,214,099, Cl. 560-256.000.
Cornell Research Foundation, Inc.: *See*—
Carmichael, Leland E., 4,213,965, Cl. 424-89.000.
Corning Glass Works: *See*—
Lemker, Richard S.; and Storey, Clyde H., 4,213,772, Cl. 65-30.00R.
Corse, Louis G., to Machines Chambon. Method for preconditioning lumps of sugar. 4,213,249, Cl. 34-12.000.
Cosby, Phillip A., to Graham Magnetics Incorporated. Tape cartridge strap cleaner. 4,213,223, Cl. 15-304.000.
Costello, Alan T.: *See*—
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., 4,213,899, Cl. 260-156.000.
Coster, Hans G. L.; Ashcroft, Robert G.; and Smith, John R., to Unisearch Limited. Location and effect of adsorbed chemicals on the dielectric substructure of membranes by ultra low frequency spectrometry. 4,214,203, Cl. 324-425.000.
Cothran, William B.: *See*—
Safrit, Sam C.; Cassidy, Edward L., Sr.; Cothran, William B.; and Farrell, Roscoe M., 4,213,312, Cl. 66-177.000.
Cotton Incorporated: *See*—
Winch, Allen R., 4,213,218, Cl. 8-151.000.
Couchoud, Paul; and Vaginay, Yves, to Rhone-Poulenc-Textile. Flame-resistant copolyesters containing phosphonic groups. 4,214,069, Cl. 528-167.000.
Coulter Electronics, Inc.: *See*—
Crews, Harold R.; Chastain, Dave, Jr.; and Ledis, Stephen L., 4,213,876, Cl. 252-408.000.
Courtney, Albert L. Water ski tow assembly. 4,213,413, Cl. 114-253.000.
Cowles, Clarence W.; Breashears, James C.; and Mungons, Edwin M., to Wilmoth, Eugene. Vehicle attached carrier pivotable about plural axes. 4,213,729, Cl. 414-462.000.
Cox, Leon: *See*—
Fister, Julius C., Jr.; Setzer, William C.; and Cox, Leon, 4,214,041, Cl. 428-607.000.
Cox, Mark S. Sounding banjo and head therefor. 4,213,368, Cl. 84-269.000.
Coy, David H.: *See*—
Kastin, Abba J.; and Coy, David H., 4,213,968, Cl. 424-177.000.
Crabtree, Kenneth: *See*—
Burns, Richard H.; and Crabtree, Kenneth, 4,213,704, Cl. 356-349.000.
Crano, John C., to PPG Industries, Inc. Preparation of boron trichloride. 4,213,948, Cl. 423-292.000.
Crawford, Herbert M. Differential transmission assembly. 4,213,352, Cl. 74-677.000.
Creange, John E.: *See*—
Schane, Harry P., Jr.; Harding, Homer R.; and Creange, John E., 4,213,977, Cl. 424-241.000.
Crews, Harold R.; Chastain, Dave, Jr.; and Ledis, Stephen L., to Coulter Electronics, Inc. Multi-purpose blood diluent for use in electronic blood analysis instrumentation. 4,213,876, Cl. 252-408.000.
Cromley, Harold D., to Marshall Equipment Co. Inc. Emergency ventilation system for enclosed livestock confinement structures. 4,213,379, Cl. 98-33.00R.
Cronson, Harry M.; Lamensdorf, David; and Ross, Gerald F., to Sperry Corporation. Transreflector scanning antenna. 4,214,248, Cl. 343-756.000.
Crosby, Alton L.; and Swank, Harry R., to GTE Products Corporation. Apparatus and process for welding plated parts. 4,214,142, Cl. 219-86.250.
Crosfield Electronics Limited: *See*—
Pugsley, Peter C.; and Wood, Peter J., 4,214,276, Cl. 358-256.000.
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, to Magyar Asvanyolaj es Foldgaz Kiserleti Intezet. Insulating felts reinforced by fibrous materials particularly for the waterproofing and/or corrosion-proofing of metal and/or concrete objects. 4,214,032, Cl. 428-280.000.
Cuisinarts, Inc.: *See*—
Jones, Barbara A., 4,213,570, Cl. 241-38.000.
Cukier, Samuel; and Khan, Irshad A., to Domtar Inc. Fabric conditioning compositions. 4,213,867, Cl. 252-8.750.
Cullen, William P.: *See*—
Larkin, John M.; Cullen, William P.; Sung, Rodney L.; and Zoleski, Benjamin H., 4,214,083, Cl. 544-277.000.
Cunningham, Donald M., to Emerson Electric Co. Electric heating elements. 4,214,150, Cl. 219-452.000.
Cunningham, Joseph E., Jr.; and Grombone, Anthony, to International Business Machines Corporation. Range tracking analog to digital converter for use with a bridge. 4,214,234, Cl. 340-347.0AD.
Curtis, Eugene E. Composite balloon figure and method of making the same. 4,213,267, Cl. 46-87.000.
Curtis, Stephen N.; and Bhargava, Hridaya N., to Beecham, Inc. Oral compositions. 4,213,961, Cl. 424-54.000.
Cuypers, Martinus H.: *See*—
Horowitz, Alexandre; and Cuypers, Martinus H., 4,213,350, Cl. 474-264.000.
D.W.A. Associates, Inc.: *See*—
Brouthers, Paul E., 4,213,263, Cl. 42-59.000.
Dagnelie, Jean-Paul G., to Etablissement Public de Diffusion dit "Telediffusion de France". Bidirectional telewriting system operating in an alternating mode over a single carrier. 4,214,123, Cl. 370-31.000.
Dahinden, Walter, to Dornag. Method and means for cooling down a stationary twist drill by a coolant. 4,213,354, Cl. 82-1.00C.
Dahlem, Peter, to Lindemann Maschinenfabrik GmbH. Scrap shearing machine. 4,213,385, Cl. 100-95.000.
Dai-Ichi Seiko Co., Ltd.: *See*—
Katata, Tetsuo, 4,213,578, Cl. 242-74.000.
Dai Nippon Printing Co., Ltd.: *See*—
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, 4,213,926, Cl. 264-74.000.
Daimler-Benz Aktiengesellschaft: *See*—
Andres, Rudolf; Grantz, Helmut; Abersfelder, Gunter; and Busch, Gerhard, 4,213,581, Cl. 242-107.40R.
Mehren, Herbert; and Wulf, Helmut, 4,213,396, Cl. 104-130.000.
Sacco, Bruno; Dalheimer, Walter; and Schwarz, Friedrich, 4,213,638, Cl. 280-808.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Kitagawa, Tsunehiro, 4,214,048, Cl. 435-7.000.
Dalal, Hormazdyar M.; Ghafghaichi, Majid; Kasprzak, Lucian A.; and Wimpfheimer, Hans, to International Business Machines Corporation. Tantalum semiconductor contacts and method for fabricating same. 4,214,256, Cl. 357-71.000.
Dalheimer, Walter: *See*—
Sacco, Bruno; Dalheimer, Walter; and Schwarz, Friedrich, 4,213,638, Cl. 280-808.000.
Dalle, Jean-Paul. Process for treating cellulosic materials with liquid ammonia. 4,213,761, Cl. 8-125.000.
Dana Corporation: *See*—
Mazziotti, Philip J., 4,213,512, Cl. 180-233.000.
Danos, James C.: *See*—
Ward, Robert R.; Chang, Richard C.; Danos, James C.; and Carden, Joseph A., Jr., 4,214,020, Cl. 427-296.000.
Dart Industries Inc.: *See*—
Petruzzi, Thomas G.; Ashton, Harold P.; and Conti, Rino, 4,213,271, Cl. 47-39.000.
Data Products Corporation: *See*—
Horning, Thomas, 4,214,194, Cl. 318-696.000.
Datow, Joachim; Decker, Martin; Merkel, Karl; and Neumayr, Franz, to BASF Aktiengesellschaft. Manufacture of $\beta$-chlorocarboxylic acid chlorides. 4,213,919, Cl. 260-544.00K.
Datta, Amitava, to Allegheny Ludlum Industries, Inc. Processing for cube-on-edge oriented silicon steel. 4,213,804, Cl. 148-111.000.
Daubach, Ewald; Horn, Dieter; Hahn, Erwin; and Uhrig, Herbert, to BASF Aktiengesellschaft. Spray-drying method for the preparation of water-dispersible pulverulent disperse dye formulations. 4,213,900, Cl. 260-208.000.
Daum, Sol J.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,214,084, Cl. 546-72.000.
Davidson, Louie E.: *See*—
Samour, Carlos M.; Jackson, Earl G.; Thomas, Samuel J.; and Davidson, Louie E., 4,213,486, Cl. 138-143.000.
Davidson, William E.: *See*—
Reinstadler, Kenneth A.; and Davidson, William E., 4,213,258, Cl. 38-77.200.
Davies, John H.; Grayson, Basil T.; and Rosinger, Herbert P., to Shell Internationale Research Maatschappij B.V. Conversion of stereoisomer into its diastereoisomer. 4,213,916, Cl. 260-465.00D.
Davis, H. R.; Long, R. H.; and Simone, A. A., to Lummus Company, The. Gravity settling. 4,213,862, Cl. 210-83.000.

Davis, James E.: *See*—
Bellos, Thomas J.; and Davis, James E., 4,213,934, Cl. 422-15.000.
Davis, Michael D.; and Gustner, Harold L., to Eaton Corporation. Hydraulic pump and improved by-pass flow means therefor. 4,213,744, Cl. 417-310.000.
Davis, Paul F., to Kraft, Inc. Rennet casein and method for treatment thereof. 4,213,896, Cl. 260-119.000.
Dawson, Oscar E. Afro oil comb. 4,213,473, Cl. 132-113.000.
Day, John C. Liquid fuel to gas converter for engines. 4,213,433, Cl. 123-549.000.
Day, Nancy C. Ornamental device. 4,214,023, Cl. 428-11.000.
De luxe General, Incorporated: *See*—
Gyori, Robert P., 4,214,171, Cl. 307-39.000.
De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See*—
Jarus, Daniel J., 4,214,124, Cl. 375-114.000.
Kuijt, Cornelis, 4,213,602, Cl. 271-279.000.
Deardorff, Duane R.; and Mann, William W., to Sperry Corporation. Dust system for a grinder-mixer. 4,213,571, Cl. 241-48.000.
DeBrick, Eric, to New River Manufacturing Company, Inc. Resilient universal locomotive suspension. 4,213,399, Cl. 105-157.00R.
Decker, Martin: *See*—
Datow, Joachim; Decker, Martin; Merkel, Karl; and Neumayr, Franz, 4,213,919, Cl. 260-544.00K.
De Deugd, Johannes A. G., to U.S. Philips Corporation. Method and apparatus for extruding a burred edge of a hole in a metal sheet. 4,213,323, Cl. 72-358.000.
de Deugd, Johannes A. G.: *See*—
Tielemans, Leonardus P. M.; and de Deugd, Johannes A. G., 4,213,659, Cl. 308-167.000.
Dedolph, Richard R., to Gravi-Mechanics Co. Field transplant systems and methods and components thereof. 4,213,273, Cl. 47-74.000.
De George, Robert P.; Brown, Paul R.; and Carbone, Victor T., to Houdaille Industries, Inc. Automatic side gauge for machine tool workpiece control and method. 4,213,733, Cl. 414-751.000.
De Geus, Arie M. Solar powered cooling apparatus. 4,213,305, Cl. 62-2.000.
De Haas, Hans: *See*—
Grebe, Klaus; and De Haas, Hans, 4,213,777, Cl. 75-0.5BA.
de Jong, Aaldert J.; and Heijmen, Hendricus J., to Shell Oil Company. Unsaturated alcohols and esters. 4,214,098, Cl. 560-231.000.
De Luca, Carlo: *See*—
Stulen, Foster B.; and De Luca, Carlo, 4,213,467, Cl. 128-733.000.
DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,214,286, Cl. 360-99.000.
Demrick, Carl J., to Herder, N.V. Bushing and grease retainer for casters. 4,213,226, Cl. 16-36.000.
Denen, D. Joseph: *See*—
Bush, Terry D.; and Denen, D. Joseph, 4,214,131, Cl. 179-84.00T.
Denninger, Claude; and Moutton, Louis, to SOGEMARIC, Societe de Gestion et de Marketing pour Industries de Consommation. Explosive trap for animals. 4,213,265, Cl. 43-84.000.
Denver Splint Company, The: *See*—
Shippert, Ronald D., 4,213,452, Cl. 128-89.00R.
de Rosset, Armand J., to UOP Inc. Two-stage process for separating mixed fatty-acid esters. 4,213,913, Cl. 260-428.500.
Dewing, Ernest W.; Huni, Jean-Paul R.; Sood, Raman R.; and Southam, Frederick W., to Alcan Research and Development Limited. Apparatus for the production of aluminium. 4,213,599, Cl. 266-166.000.
Dickey, Thomas E. Four-in-a-row board game. 4,213,616, Cl. 273-271.000.
Dickson, John F., to Plessey Handel und Investments AG. Voltage multiplier employing clock gated transistor chain. 4,214,174, Cl. 307-229.000.
Dickson, Vernon E.; Lee, James G. C.; and Saini, Gurbachan S., to Sangamo Company Limited. Switching circuit for radiosonde. 4,214,207, Cl. 455-95.000.
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, to Otto Fuchs KG; and Schuco Heinz Schurmann GmbH & Co. Tool for deforming a plurality of groove defining flanges against insulating bars in the grooves. 4,213,236, Cl. 29-243.500.
Dienstuhl, Karl W.: *See*—
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, 4,213,236, Cl. 29-243.500.
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, to Siemens Aktiengesellschaft. Magnetic lens system for corpuscular radiation equipment. 4,214,166, Cl. 250-396.0ML.
Di Gaetano, Nicholas A. Device for use in counting small items. 4,213,730, Cl. 414-675.000.
Dillard, George M., to United States of America, Navy. Magnetic drum storage for the track before detect system. 4,214,239, Cl. 343-5.0VQ.
DiMarco, Bernard; and Hempstead, John C., to Gould Inc. Push-push switch. 4,214,219, Cl. 335-23.000.
Dipietromaria, Edoardo, to Indesit Industria Elettrodomestici Italiana S.p.A. Tuner device for a television receiver. 4,214,212, Cl. 455-190.000.
Dirheimer, Guy; and Louisot, Pierre, to Boehringer Ingelheim GmbH. Antiviral compositions containing a transfer-ribonucleic acid. 4,213,970, Cl. 424-180.000.
Di Rosa, Gaetano, to F.A.T.A.-Fabrica Apparecchi Di Sollevamento E Trasporto Ed Affini S.p.A. Dampened suspended carrier suspension. 4,213,398, Cl. 105-150.000.
Di Stefano, Alfonso. Rotary engine. 4,213,427, Cl. 123-43.0AA.
Dittmer, Helmut: *See*—
Muders, Rolf; Leister, Heinrich; Dittmer, Helmut; and Schonhagen, Hubert, 4,213,910, Cl. 260-371.000.
Dobler, Peter: *See*—
Schoettle, Klaus; Dobler, Peter; Lewin, Helmut; and Koester, Eberhard, 4,213,222, Cl. 15-100.000.
Dobson, Michael J. Solar collector. 4,213,929, Cl. 264-129.000.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Haese, Egon; Moll, Hans; and Willms, Rolf, 4,213,945, Cl. 423-240.000.
Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft: *See*—
Franzen, Jochen; and Weiss, Gerhard, 4,213,557, Cl. 228-122.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Stotz, Erich; and Sivers, Rolf, 4,213,632, Cl. 280-697.000.
Dr. Werner Freyberg, Chemische Fabrik Delitia Nachf.: *See*—
Praxl, Werner; and Ehret, Reiner, 4,213,967, Cl. 424-128.000.
Documation Incorporated: *See*—
Cattorini, Joseph F.; Park, Thomas R.; and Martin, John K., 4,213,601, Cl. 270-61.00F.
Doi, Hideo: *See*—
Miura, Yoshiharu; Aoyagi, Sadayoshi; and Miyamoto, Kazuhisa, 4,213,962, Cl. 424-78.000.
Doi, Kiyosumi: *See*—
Moroe, Tatsuo; Komatsu, Akira; Doi, Kiyosumi; and Moroe, Mitio, 4,214,110, Cl. 585-241.000.
Dolezal, Zdenek; and Hof, Urs J., to Bulova Watch Company, Inc. Thermoelectrically-powered wrist watch. 4,213,292, Cl. 368-204.000.
Dolhyj, Serge R.; Suresh, Dev D.; and Grasselli, Robert K., to Standard Oil Company. Esterification of aromatic aldehydes. 4,213,917, Cl. 260-465.00D.
Domtar Inc.: *See*—
Cukier, Samuel; and Khan, Irshad A., 4,213,867, Cl. 252-8.750.
Lucas, John M., 4,213,708, Cl. 356-429.000.
Donermeyer, Donald D.; and Martins, Joseph G., to Monsanto Company. Cavity filling with a hot melt adhesive composition. 4,214,019, Cl. 427-142.000.
Donlon, Frances M.; and Van Buskirk, Jerry H. Rescue vest for newborn babies. 4,213,204, Cl. 2-94.000.
Donnally, William, to United States of America, Army. In-bore telemetry information measuring system. 4,214,231, Cl. 340-207.00R.
Dornag: *See*—
Dahinden, Walter, 4,213,354, Cl. 82-1.00C.
Douaud, Andre; and Rialan, Joseph, to Institut Francais du Petrole. Method and device for automatically adjusting the spark advance of a controlled ignition engine. 4,213,429, Cl. 123-414.000.
Douglas, George H.: *See*—
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,214,003, Cl. 424-301.000.
Douklias, Nikolaos: *See*—
Aulich, Hubert; Douklias, Nikolaos; Hacker, Heinz; and Zeidler, Guenter, 4,213,672, Cl. 350-96.230.
Dow Chemical Company, The: *See*—
Hall, Richard H.; Haigh, Daniel H.; and Hansen, Robert D., 4,213,831, Cl. 203-86.000.
Klingler, Thomas C.; Wessling, Ritchie A.; and Gibbs, Dale S., 4,214,096, Cl. 560-147.000.
Knight, George W.; and Mach, Dennis E., 4,213,880, Cl. 252-431.00R.
Larson, Larry L., 4,213,975, Cl. 424-200.000.
Lefevre, Joseph D., 4,213,833, Cl. 204-98.000.
Draftex Development AG: *See*—
Bright, Robert G., 4,214,036, Cl. 428-358.000.
Dragerwerk Aktiengesellschaft: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,213,453, Cl. 128-202.260.
Dreier, Juergen: *See*—
Roth, Manfred; and Dreier, Juergen, 4,213,449, Cl. 126-447.000.
Dremin, Vladimir G.: *See*—
Vydrin, Vladimir N.; Berezin, Evgeny N.; and Dremin, Vladimir G., 4,213,320, Cl. 72-189.000.
Dresser Industries, Inc.: *See*—
Chien, Loring C., 4,213,740, Cl. 417-63.000.
Drimmer, Bernard E., to United States of America, Army. Anti-tank mine with peripheral charge initiation. 4,213,391, Cl. 102-8.000.
Droese, K. H.; and Fluehter, Jurgen. Method of an installation for breeding sea-water creatures in tanks. 4,213,421, Cl. 119-3.000.
Dromgold, Luther D.: *See*—
Bitely, Clarence J., Jr.; Dromgold, Luther D.; and Murray, William S., Jr., 4,213,868, Cl. 252-11.000.
Dubief, Claude: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,213,960, Cl. 424-47.000.
Dudko, Daniil A.: *See*—
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.
Dufour, Martin J., to W. C. Lamb. Pipe inspection system and method. 4,213,345, Cl. 73-637.000.
Dufresne, Jean L. Capping board for electrolytic metal refining. 4,213,842, Cl. 204-279.000.
Dumont, Claude: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,213,989, Cl. 424-263.000.

Duncan, Gary L.: *See*—
Steiner, Robert H.; Duncan, Gary L.; and Touhsaent, Robert E., 4,214,039, Cl. 428-414.000.
Dunlop Limited: *See*—
Ottewell, Roger J.; and Lowe, Jack M., 4,213,485, Cl. 138-130.000.
Pope, George A.; and Bourne, Alan J., 4,213,491, Cl. 152-330.00L.
Ware, Peter G., 4,213,234, Cl. 29-159.100.
Du Pont de Nemours, E. I., and Company: *See*—
Apotheker, David; and Krusic, Paul J., 4,214,060, Cl. 525-387.000.
Krespan, Carl G., 4,214,070, Cl. 528-220.000.
Mahler, Walter; and Forshey, William O., Jr., 4,213,949, Cl. 423-329.000.
Mahler, Walter, 4,213,950, Cl. 423-329.000.
Turner, Robert L., 4,213,886, Cl. 260-29.6MM.
Wolf, Anthony D., 4,213,773, Cl. 71-92.000.
Dutcher, Gerald L.: *See*—
Sengstock, Paul J., Jr.; and Dutcher, Gerald L., 4,213,586, Cl. 244-158.000.
Dvoskin, Grigory I.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,213,908, Cl. 260-348.160.
Dynamote Corporation: *See*—
Schneider, Franklin R., 4,214,198, Cl. 320-15.000.
Dyno Industries A.S.: *See*—
Aanonsen, Bent; Odberg, Paul-Johny; and Samuelsen, Eirik, 4,213,712, Cl. 366-178.000.
E.G.O. Regeltechnik GmbH: *See*—
Kicherer, Robert; and Schilling, Wilfried, 4,214,151, Cl. 219-492.000.
E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John, 4,214,081, Cl. 542-424.000.
Liu, Wen-Chih; Brown, William E.; and Astle, Gail L., 4,213,966, Cl. 424-123.000.
Varma, Ravi K., 4,213,912, Cl. 260-397.100.
Vogt, B. Richard, 4,213,982, Cl. 424-248.520.
Eagle Electric Mfg. Co., Inc.: *See*—
Munroe, Ronald G., 4,214,135, Cl. 200-51.170.
East Wind Industries, Inc.: *See*—
Melander, Clarence, 4,213,219, Cl. 9-4.00R.
Eastman, James M.: *See*—
Rogers, Francis R.; and Eastman, James M., 4,213,741, Cl. 417-79.000.
Eastman Kodak Company: *See*—
Chen, Tsang J., 4,214,047, Cl. 430-448.000.
Evans, John D., Jr., 4,213,707, Cl. 356-387.000.
Hayward, John S.; Snavely, Benjamin B.; and Tschang, Pin S., 4,214,264, Cl. 358-44.000.
Peffer, Robert M.; and Braun, Charles H., 4,213,603, Cl. 271-229.000.
Wooding, David L.; and Pletcher, Robert W., 4,213,794, Cl. 134-6.000.
Eaton Corporation: *See*—
Davis, Michael D.; and Gustner, Harold L., 4,213,744, Cl. 417-310.000.
Mihalic, William T., 4,213,442, Cl. 123-198.00F.
Eberle, William J., to General Battery Corporation. High rate, battery testing apparatus and method. 4,214,204, Cl. 324-437.000.
Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,213,881, Cl. 252-436.000.
Eckell, Albrecht; Matthies, Paul; Pilz, Georg; and Rotzoll, Rudi-Heinz, to BASF Aktiengesellschaft. Manufacture of a highly concentrated aqueous solution of a dicarboxylic acid diamine salt and a nylon precondensate. 4,213,884, Cl. 260-29.20N.
Eckhardt, Wolfgang; Hubele, Adolf; and Kunz, Walter, to Ciba-Geigy Corporation. Fungicidal alkoxyalkoxyacetyl acylalanines. 4,214,005, Cl. 424-309.000.
Eda, Tadahiro: *See*—
Imai, Chikara; Tatsumi, Susumu; and Eda, Tadahiro, 4,213,693, Cl. 355-14.00D.
Eddinger, Ralph T.; and Friedman, Louis D., to Cogas Development Company. Fluidized coal carbonization. 4,213,826, Cl. 201-31.000.
Eduard Kusters: *See*—
Ahrweiler, Karl-Heinz, 4,213,748, Cl. 425-371.000.
Eggert, Hans-Joachim; Zenkert, Heinrich; Kuehne, Rudi; and Oberberger, Otto, to Siemens Aktiengesellschaft. Electrical housing with stacking bumpers. 4,213,532, Cl. 206-504.000.
Ehret, Reiner: *See*—
Praxl, Werner; and Ehret, Reiner, 4,213,967, Cl. 424-128.000.
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, to Zahnradfabrik Friedrichshafen AG. Hydraulic wheel drive with clutch. 4,213,514, Cl. 180-308.000.
Eibofner, Eugen: *See*—
Reich, Heinrich; and Eibofner, Eugen, 4,213,756, Cl. 433-126.000.
Eickmann, Karl. Internal gear hydraulic device with balancing recesses in the housing and crescent shaped separation member. 4,213,746, Cl. 418-71.000.
Ellis, Charles R.: *See*—
Adams, William M.; Blakely, Robert F.; Ellis, Charles R.; and Mead, Judson, 4,214,238, Cl. 340-690.000.
Ellis, Clarence E. Slow cooking apparatus. 4,213,381, Cl. 99-446.000.
Ellis, James R., to LeRoy Enterprises, Inc. Apparatus for applying liquid coating to food products. 4,213,417, Cl. 118-30.000.
Ellson, Allan H., to Pye (Electronic Products) Ltd. Apparatus for the infusion of a labor-inducing drug into the bloodstream of a patient. 4,213,455, Cl. 128-214.00E.
Elmberg, Dwayne R.; and Hawkins, Royal R., to Honeywell Inc. Slope control system. 4,213,503, Cl. 172-4.500.
Elsbett, Gunter: *See*—
Elsbett, Ludwig; and Elsbett, Gunter, 4,213,438, Cl. 123-668.000.
Elsbett, Ludwig; and Elsbett, Gunter. Piston for internal combustion engines, especially diesel engines. 4,213,438, Cl. 123-668.000.
Elser, Wolfgang: *See*—
Ruske, Manfred; and Elser, Wolfgang, 4,213,757, Cl. 8-518.000.
Ely, Richard R., to Itek Corporation. Instant film color back adaptor for a camera-processor. 4,213,695, Cl. 355-45.000.
Emerson Electric Co.: *See*—
Cunningham, Donald M., 4,214,150, Cl. 219-452.000.
Endo, Kiyonobu: *See*—
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, 4,214,249, Cl. 346-76.00L.
Energy Alternatives, Inc.: *See*—
Spaulding, David B., 4,213,404, Cl. 110-229.000.
Engelhard Minerals & Chemicals Corporation: *See*—
Jameson, M. Phillip, 4,213,853, Cl. 209-166.000.
Engelhard, Philippe; Legendre, Michel; Paris, Guy; and Szabo, Georges, to Compagnie Francaise de Raffinage. Method of using catalysts for reforming or isomerizing hydrocarbons. 4,213,849, Cl. 208-139.000.
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, to Boehringer Ingelheim GmbH. 1-(4-Acylamino-phenyl)-2-amino-ethanols and salts thereof. 4,214,001, Cl. 424-300.000.
English Electric Valve Company Limited: *See*—
Nixon, Ralph D., 4,214,025, Cl. 428-67.000.
Entschel, Roland; Mueller, Curt; and Steinemann, Willy, to Sandoz Ltd. Cationic 5-arylazo-6-hydroxypyridone-2 dyes. 4,213,898, Cl. 260-156.000.
Equipment Company of America: *See*—
Thurmond, Elmer T., Jr., 4,213,647, Cl. 294-90.000.
Erickson, Donald P. Air distribution control system. 4,213,447, Cl. 126-429.000.
Erickson, Erick E.; Wildman, John R.; and Meyer, Burton C., to Marvin Glass & Associates. Multi-stage vehicle toy. 4,213,268, Cl. 46-202.000.
Erico Products, Inc.: *See*—
Spiegelberg, Gary R., 4,214,144, Cl. 219-99.000.
Eriksson, Erik S. Apparatus for displacement washing of fibrous material suspended in a liquid. 4,213,822, Cl. 162-242.000.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Multiple gaseous discharge display/memory panel having improved voltage characteristics. 4,214,183, Cl. 313-221.000.
Ernstsson, Ernst G.; and Nantin, Hans O. I., to Tetra Pak International AB. Method and an arrangement for the cleaning and sterilizing of a filler pipe on a packing machine. 4,213,795, Cl. 134-22.00C.
Escher Wyss Limited: *See*—
Biondetti, Mario; and Marchioro, Ignazio, 4,213,232, Cl. 29-116.0AD.
Espitalie, Jean: *See*—
Madec, Marcel; Espitalie, Jean; Laporte, Jean-Loup; and Barsony, Imre, 4,213,763, Cl. 23-230.0EP.
Estes, Robert F.: *See*—
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,213,478, Cl. 137-85.000.
ETA A.G. Ebauches-Fabrik: *See*—
Perrot, Friedrich, 4,213,295, Cl. 368-236.000.
Etablissement Public de Diffusion dit "Telediffusion de France": *See*—
Dagnelie, Jean-Paul G., 4,214,123, Cl. 370-31.000.
Etkin, Bernard. Method and apparatus for particle classification. 4,213,852, Cl. 209-136.000.
Euler, August H. L.; and Beziac, Gilbert F. A., to Societe Nationale Industrielle Aerospatiale. Helicopter rotor blade. 4,213,739, Cl. 416-226.000.
Evans, John D., Jr., to Eastman Kodak Company. Device for improving the accuracy of optical measuring apparatus and the like. 4,213,707, Cl. 356-387.000.
Everaarts, Klaas, to U.S. Philips Corporation. Digital transmission system having direct bit extraction from scrambled bit streams. 4,214,206, Cl. 375-4.000.
Exxon Research & Engineering Co.: *See*—
Eberly, Paul E., Jr., 4,213,881, Cl. 252-436.000.
Luallin, Edwin D., 4,214,063, Cl. 526-68.000.
Saxton, Arthur L., 4,213,848, Cl. 208-127.000.
F.A.T.A.-Fabrica Apparecchi Di Sollevamento E Trasporto Ed Affini S.p.A.: *See*—
Di Rosa, Gaetano, 4,213,398, Cl. 105-150.000.
Fabrication Unlimited, Inc.: *See*—
Wagner, Karl, 4,213,865, Cl. 210-522.000.
Fager, Earl E. C.: *See*—
Goldstein, Alma W.; and Fager, Earl E. C., 4,214,078, Cl. 536-17.00R.
Fah, Hansjakob, to Ciba-Geigy Corporation. Process for producing hydroxydiaryl ethers. 4,214,086, Cl. 546-290.000.
Fairchild Camera and Instrument Corporation: *See*—
Chan, John Y., 4,214,175, Cl. 307-264.000.
Fak, Viiveke; Ingemarsson, Ingemar B.; Blom, Rolf; Forchheimer, Robert; and Hellberg, Bjorn I. Personal identification system. 4,214,230, Cl. 340-149.00A.

Fanelli, Anthony J.; and Gelbein, Abraham P., to Lummus Company, The. Production of carboxylic acids from nitriles. 4,214,087, Cl. 546-319.000.

Farkas, L. Peter: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Farrakhov, Nail S.: *See*—
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.

Farrell, John W.; and Andrews, Jere L., to United States of America, Army. Gyrodynamic fixture for measuring thrust force components. 4,214,156, Cl. 250-231.0SE.

Farrell, Roscoe M.: *See*—
Safrit, Sam C.; Cassidy, Edward L., Sr.; Cothran, William B.; and Farrell, Roscoe M., 4,213,312, Cl. 66-177.000.

Farrington, Alan: *See*—
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, 4,213,821, Cl. 162-72.000.

Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Lightweight, high refractive index glasses for spectacle lenses. 4,213,786, Cl. 106-47.00Q.

Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. High refractive index glasses of limited specific gravity for distance and near vision spectacle lenses. 4,213,787, Cl. 106-47.00Q.

Fegel, Albert: *See*—
Roeschlaub, Ronald C.; and Fegel, Albert, 4,213,328, Cl. 73-49.700.

Feichtinger, Gerhard; Skatsche, Othmar; and List, Hans, to List, Hans. Internal combustion engine. 4,213,439, Cl. 123-195.00S.

Felix, Pierre, to Thomson-CSF. Apparatus and a process for reading a target of a camera tube. 4,214,275, Cl. 358-223.000.

Fenichel, Richard L.; Wei, Peter H. L.; Gregory, Francis J.; and Alburn, Harvey E., to American Home Products Corporation. Thiazolo[3,2-a]benzimidazoles, imidazo [2,1-b]thiazoles, and related compounds as antineoplastic agents, and enhancers of the immune response. 4,214,089, Cl. 548-151.000.

Fernandez, Luis, to Continental Group, Inc., The. Valve gate mechanism for injection molding. 4,213,751, Cl. 425-566.000.

Ferraro, Frank A.; and Kiraly, Ernest F., to Warner-Lambert Company. Ladies' razor system. 4,213,240, Cl. 30-47.000.

Ferrie, Ronald G., to RCA Corporation. Signal selecting system. 4,214,213, Cl. 328-117.000.

Ferrini, Pier G.: *See*—
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,213,993, Cl. 424-273.00B.
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,213,980, Cl. 424-246.000.

Fickelscher, Horst, to Siemens Aktiengesellschaft. Method for electrolytically etching of a recrystallized aluminum foil. 4,213,835, Cl. 204-129.250.

Fies, William J.; Smith, Ronald D.; Reeher, John R.; and Story, Michael S., to Finnigan Corporation. Mass spectrometer system and method for control of ion energy for different masses. 4,214,160, Cl. 250-292.000.

Figoski, John W.: *See*—
Hill, Henry A.; Figoski, John W.; and Ballard, Paul T., 4,213,706, Cl. 356-353.000.

Fike Metal Products Corporation: *See*—
McIntire, Ronald A., 4,213,567, Cl. 239-396.000.

Filer, Burt. Tube extractor. 4,213,239, Cl. 29-726.000.

Filterwerk Mann & Hummel GmbH: *See*—
Blind, Karl; and Klotz, Arthur, 4,213,643, Cl. 292-247.000.

Fink, Anton; and Fink, Nicholas A. Centrifugally-actuated chuck attachment. 4,213,621, Cl. 279-1.00C.

Fink, Nicholas A.: *See*—
Fink, Anton; and Fink, Nicholas A., 4,213,621, Cl. 279-1.00C.

Finnigan Corporation: *See*—
Fies, William J.; Smith, Ronald D.; Reeher, John R.; and Story, Michael S., 4,214,160, Cl. 250-292.000.

Fiquet, Claire: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,213,960, Cl. 424-47.000.

Firth, Rowland V. D., III; and Goff, Willie, Jr., to International Business Machines Corporation. Printer ribbon supply mechanism with end of ribbon detect expedient which reduces ribbon drag. 4,213,575, Cl. 242-57.000.

Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., to Bell Telephone Laboratories, Incorporated. Apparatus and method for holding and planarizing thin workpieces. 4,213,698, Cl. 355-77.000.

Fischer, Manfred: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,213,514, Cl. 180-308.000.

Fishback, Alton J.: *See*—
Calvert, Rodney K.; Scott, Dale K.; and Fishback, Alton J., 4,213,283, Cl. 53-48.000.

Fisons Limited: *See*—
Bantick, John R.; Hardern, David N.; and Lee, Thomas B., 4,213,903, Cl. 548-250.000.

Fister, Julius C., Jr.; Setzer, William C.; and Cox, Leon, to Swiss Aluminium Ltd. Composite aluminum capacitor foil. 4,214,041, Cl. 428-607.000.

Fivian, Daniel A., to Maag Gear-Wheel & Machine Company Limited. Method for dressing a grinding wheel. 4,213,277, Cl. 51-325.000.

Flatland, Lloyd P. Rotary connector for a dental handpiece. 4,213,243, Cl. 433-126.000.

Fleischhauer, Werner, to Bosch-Siemens Hausgerate GmbH. Indicator for the extent of clarification of waterheaters in electric household appliances. 4,214,148, Cl. 219-308.000.

Floeter, Larry A., to Brunswick Corporation. Control unit for marine engines employing throttle only control. 4,213,353, Cl. 74-878.000.

Floyd Bell Associates Inc.: *See*—
Bush, Terry D.; and Denen, D. Joseph, 4,214,131, Cl. 179-84.00T.

Floyd, Paul D.: *See*—
Braginetz, Paul A.; and Floyd, Paul D., 4,213,666, Cl. 339-75.00M.

Fluck, Jakob: *See*—
Schefer, Kurt; and Fluck, Jakob, 4,213,573, Cl. 242-18.00A.

Fluehter, Jurgen: *See*—
Droese, K. H.; and Fluehter, Jurgen, 4,213,421, Cl. 119-3.000.

FMC Corporation: *See*—
Beacham, Harry H., 4,213,889, Cl. 260-45.7PH.
Hirahara, Katsuji, 4,214,013, Cl. 426-629.000.
Plummer, Ernest L., 4,214,004, Cl. 424-305.000.

Focke, Heinz, to Focke & Pfuhl. Cutting apparatus for separating cigarette wrapper blanks from web. 4,213,362, Cl. 83-100.000.

Focke & Pfuhl: *See*—
Focke, Heinz, 4,213,362, Cl. 83-100.000.

Fogarty, A. Edward: *See*—
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., 4,213,266, Cl. 46-1.00R.

Fogarty, Bonnie R.: *See*—
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., 4,213,266, Cl. 46-1.00R.

Forchheimer, Robert: *See*—
Fak, Viiveke; Ingemarsson, Ingemar B.; Blom, Rolf; Forchheimer, Robert; and Hellberg, Bjorn I., 4,214,230, Cl. 340-149.00A.

Ford, Ernest C., Jr.: *See*—
Bristowe, William W.; Ford, Ernest C., Jr.; and Reed, Weldon N., 4,213,837, Cl. 204-159.190.

Ford Motor Company: *See*—
Simko, Aladar O., 4,213,435, Cl. 123-446.000.

Forshey, William O., Jr.: *See*—
Mahler, Walter; and Forshey, William O., Jr., 4,213,949, Cl. 423-329.000.

Forster, Siegfried; Hewing, Gunter; and Kleemann, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Vehicular propulsion gas turbine motor. 4,213,297, Cl. 60-39.51R.

Foundos, Stavros, to National Research Development Corporation. Apparatus for determining the result of answers to a set of related questions. 4,213,251, Cl. 35-9.00R.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,213,960, Cl. 424-47.000.

Fowler, Donald W.: *See*—
Bresie, Don A.; Fowler, Donald W.; and Burns, Jack M., 4,213,476, Cl. 137-2.000.

Fowler, James H.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.

Fox, Fred: *See*—
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.

Fox, Kenneth H. S. Fishing reel. 4,213,579, Cl. 242-84.20B.

Foxboro Company, The: *See*—
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,213,478, Cl. 137-85.000.

Frame, Robert R., to UOP Inc. Method of reactivating a catalytic composite of an adsorptive carrier material and a mercaptan oxidation catalyst. 4,213,877, Cl. 252-412.000.

Francombe, Maurice H.: *See*—
Noreika, Alexander J.; and Francombe, Maurice H., 4,213,781, Cl. 75-134.00P.

Franconi, Cafiero: *See*—
Bonori, Maurizio, 4,214,202, Cl. 324-313.000.

Franke, Siegfried: *See*—
Knauf, Alfons; Bold, Jorg; and Franke, Siegfried, 4,214,027, Cl. 428-113.000.

Frankel, David C.: *See*—
Persson, Frederick M.; and Frankel, David C., 4,213,556, Cl. 228-104.000.

Franklin, Alfred A.: *See*—
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,214,008, Cl. 426-53.000.

Franson, Paul D.: *See*—
Casciani, Ralph A.; Wilbern, Wilmer L.; Mangan, William E.; and Franson, Paul D., 4,213,955, Cl. 423-442.000.

Frantzis, Paul D.: *See*—
Rzeszewski, Theodore S.; and Frantzis, Paul D., 4,214,274, Cl. 358-193.100.

Franzen, Jochen; and Weiss, Gerhard, to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft. Method for producing a mass filter analyzer system and analyzer system produced according to the method. 4,213,557, Cl. 228-122.000.

Freeman, Alfred B. Analog displays for electronic timepieces. 4,213,294, Cl. 368-82.000.

Fremont, Henry A.; and Hedrick, Edward F., to Champion International Corporation. Emission control system and method. 4,213,947, Cl. 423-245.000.

Freudenberger, Dieter; and Wunder, Friedrich, to Hoechst Aktiengesellschaft. Process for the preparation of ethylene glycol. 4,214,106, Cl. 568-864.000.

Freund, Samuel M.; Maier, William B., II; Beattie, Willard H.; and Holland, Redus F., to United States of America, Energy. Laser-induced separation of hydrogen isotopes in the liquid phase. 4,213,836, Cl. 204-157.10R.

Frick, Willy; and Hubele, Adolf, to Ciba-Geigy Corporation. 1,1-Diphenylethene derivatives as microbicides. 4,213,990, Cl. 424-269.000.

Friedman, Louis D.: *See—*
Eddinger, Ralph T.; and Friedman, Louis D., 4,213,826, Cl. 201-31.000.

Friedrich, Reinhard, to Werner & Pfleiderer. Method of and apparatus for controlling the viscosity of molten plastics material which is to be moulded. 4,213,747, Cl. 425-144.000.

Friend, Donald L.; Grosko, John A.; and Liniger, Richard B., II, to United States Steel Corporation. Retractable hood for transfer of coke. 4,213,829, Cl. 202-263.000.

Frost, Charles C.; and Weis, Siegfried K., to C. L. Frost & Son, Inc. Conveyor roller assembly. 4,213,523, Cl. 193-37.000.

Frost, Lawrence W.: *See—*
Alvino, William M.; and Frost, Lawrence W., 4,214,071, Cl. 528-222.000.

Fuji Electric Co., Ltd.: *See—*
Otsuka, Kei; Shigehara, Masamichi; and Yokokawa, Sumio, 4,214,289, Cl. 361-20.000.

Fuji Jokogyo Kabushiki Kaisha: *See—*
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, 4,213,596, Cl. 254-134.30R.

Fuji Photo Film Co., Ltd.: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 4,213,784, Cl. 430-616.000.
Kamiyama, Kouzi, 4,213,788, Cl. 106-47.00Q.

Fuji Photo Optical Co., Ltd.: *See—*
Koda, Takao, 4,213,685, Cl. 354-193.000.

Fujii, Hirokazu. Method and structure for preventing removal of grip covers from metallic bats. 4,213,607, Cl. 273-72.00A.

Fujii, Katsutoshi: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.

Fujii, Setsuro; Sakurai, Yojiro; Nakayama, Toyoo; and Matsui, Ryoji, to Torii & Co., Ltd. Amino- or guanidino-1,2,3,4-tetrahydro-1-naphthoic esters. 4,214,093, Cl. 560-34.000.

Fujii, Yoshizo: *See—*
Miyashita, Toshio; Fujii, Yoshizo; and Sawabe, Takeshi, 4,213,524, Cl. 194-2.000.

Fujino, Teruhisa; Osawa, Fujio; Nagao, Noriaki; and Hanji, Shigeo, to Kabushiki Kaisha Koden Seisakusho. Loran receiving apparatus. 4,214,245, Cl. 343-103.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; and Saito, Yoshihisa, 4,214,094, Cl. 560-42.000.

Fujita, Hisaya; Ando, Hiroshi; and Sato, Setsuo, to Yokogawa Electric Works, Ltd. Indicating recorder. 4,214,250, Cl. 346-145.000.

Fujitec Co., Ltd.: *See—*
Ando, Koji, 4,213,517, Cl. 187-29.00R.

Fujitsu Limited: *See—*
Nara, Yasuhiro; Sohma, Yukio; and Hattori, Akira, 4,214,228, Cl. 371-40.000.

Fukui, Hiroshi: *See—*
Kimura, Shin; Fukui, Hiroshi; and Terasawa, Yoshio, 4,214,254, Cl. 357-38.000.

Fukui, Hisaaki: *See—*
Ibata, Jyoji; Fukui, Hisaaki; Yuasa, Takeo; and Katoh, Michio, 4,214,026, Cl. 428-67.000.

Fukushima, Isao: *See—*
Nakagaki, Harushige; Iwasaki, Syunji; and Fukushima, Isao, 4,214,299, Cl. 363-8.000.

Funk, Smith A.; Klasen, Charles J.; and Vilmanis, Ilmars, to Celotex Corporation, The. Laminate of metal with thermoplastic material. 4,213,487, Cl. 138-149.000.

Furrow, Mitchell J. Wheel rim with non-slip interlocking device. 4,213,654, Cl. 301-20.000.

Furukawa, Masamichi, to Ricoh Company, Ltd. Electronic shutter driving device for camera. 4,213,683, Cl. 354-24.000.

Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toyohiko, to Kobe Steel, Ltd. Process for preventing formation of gypsum scale in a flue gas desulfurization process. 4,213,946, Cl. 423-242.000.

Furuta, Kenzi: *See—*
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,214,281, Cl. 360-61.000.
Sato, Masanobu; and Furuta, Kenzi, 4,214,282, Cl. 360-69.000.

Furuya, Nobuo: *See—*
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,213,541, Cl. 222-92.000.

Furuya, Rikizo: *See—*
Okushima, Hiromi; Nitta, Issei; and Furuya, Rikizo, 4,213,902, Cl. 260-239.570.

Fushimi, Akihiro; Tabara, Noboru; and Isaki, Mikio, to Pioneer Electronic Corporation. Drive mechanism for cassette tape recorders. 4,214,283, Cl. 360-71.000.

Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; Watanabe, Hiroshi; and Takagi, Toshinori, 4,213,844, Cl. 204-298.000.

Gade, Ernst-August. Device for protection of the gonads. 4,214,167, Cl. 250-515.000.

Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart. Apparatus for the production of an electric stack capacitor of metallized synthetic material films. 4,213,817, Cl. 156-474.000.

Galasso, Francis S.; and Veltri, Richard D., to United Technologies Corporation. Silicon nitride coated carbon fibers and composites. 4,214,037, Cl. 428-367.000.

Gale, Michael T., to RCA Corporation. Projector for reading out color-encoded focused image holograms employing an optimum encoding scheme. 4,213,673, Cl. 350-162.0SF.

Galushkin, Boris A.: *See—*
Talroze, Viktor L.; Grishin, Vladimir D.; and Galushkin, Boris A., 4,214,161, Cl. 250-303.000.

Gambro AB: *See—*
Boberg, Nils G. E.; and Carlsson, Per-Olov A. V., 4,213,858, Cl. 210-23.00R.

Gannota, Boris V.: *See—*
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.

Garcia, Alfred B.: *See—*
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,052, Cl. 435-55.000.

Gardner, James J. Fireplace heater unit. 4,213,444, Cl. 126-130.000.

Garman, John A.; and Mamuzic, Rastko, to Great Lakes Chemical Corporation. Purification of brominated organic products. 4,214,103, Cl. 568-639.000.

Garrett, Roger; and Liversain, Andre. Programmer. 4,213,562, Cl. 236-46.00R.

Gates, Wendall C. Liquid sampler device. 4,213,342, Cl. 73-421.00B.

Gazdecki, Frank J.: *See—*
Charneski, Mitchell D.; Kelley, James K.; and Gazdecki, Frank J., 4,214,121, Cl. 174-84.00C.

Gebert, Ulrich; Musil, Josef; and Weber, Rolf-Ortwin, to Hoechst Aktiengesellschaft. Novel derivatives of imidazole and pharmaceutical compositions containing them and method of use. 4,213,986, Cl. 424-250.000.

Gebert, Ulrich; and Granzer, Ernold, to Hoechst Aktiengesellschaft. Imidazolyl-(2)-carbinols having hypolipidemic action and process for preparing them. 4,213,994, Cl. 424-273.00R.

Gebr. Knauf Westdeutsche Gipswerke: *See—*
Knuaf, Alfons; Bold, Jorg; and Franke, Siegfried, 4,214,027, Cl. 428-113.000.

Gehrig, Neil E.; and Marhofer, Edwin G., to Gulf Oil Corporation. Water-resistant extrudable aqueous gel blasting agent and simplified method of manufacture. 4,213,809, Cl. 149-60.000.

Geiler, Volkmar: *See—*
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,786, Cl. 106-47.00Q.
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,787, Cl. 106-47.00Q.

Gelbein, Abraham P.: *See—*
Fanelli, Anthony J.; and Gelbein, Abraham P., 4,214,087, Cl. 546-319.000.

General Battery Corporation: *See—*
Eberle, William J., 4,214,204, Cl. 324-437.000.

General Dynamics Corporation Pomona Division: *See—*
Sanders, Ralph K., 4,213,624, Cl. 280-43.120.

General Electric Company: *See—*
Carson, Andrew B., Jr., 4,213,716, Cl. 400-196.100.
Hall, Robert N., 4,214,253, Cl. 397-29.000.
Hardy, Albert L., 4,213,338, Cl. 73-299.000.
Hawkins, Larry L., 4,213,250, Cl. 34-53.000.
Jones, Clifford M.; and Surber, William A., 4,213,714, Cl. 400-124.000.
Jones, William B., Jr., 4,214,216, Cl. 331-94.50C.
Keen, William A., Jr., 4,214,119, Cl. 174-31.00R.
Keim, Thomas A., 4,214,182, Cl. 310-216.000.
Kiefer, George E.; and Herbst, LeRoy J., 4,213,313, Cl. 68-12.00R.
Lucek, John R.; and McCall, David L., 4,214,138, Cl. 200-144.00B.
Mann, Friedrich H.; and Sensabaugh, Paul F., 4,214,197, Cl. 320-2.000.
Reinstadler, Kenneth A.; and Davidson, William E., 4,213,258, Cl. 38-77.200.
Sawyer, Thomas F., 4,213,497, Cl. 164-60.000.

General Instrument Corporation: *See—*
Lipsky, Stephen E., 4,214,316, Cl. 455-141.000.

General Motors Corporation: *See—*
Brademeyer, David L., 4,213,655, Cl. 303-6.00C.
Coha, Thomas F.; and Owen, Marvin L., 4,213,415, Cl. 116-28.100.
Hamparian, Nshan, 4,213,441, Cl. 123-196.00R.
Irwin, Clarence C.; Manz, David F.; and Auman, John T., 4,213,652, Cl. 297-478.000.
Kennedy, Lawrence C.; and Kowalis, Joseph, 4,213,620, Cl. 277-235.00B.
Longhouse, Richard E., 4,213,426, Cl. 123-41.490.
Persson, Frederick M.; and Frankel, David C., 4,213,556, Cl. 228-104.000.
Prescott, John F., Jr.; and Roberts, William H., 4,213,327, Cl. 73-38.000.

Williams, James R., 4,213,738, Cl. 416-95.000.
General Tire & Rubber Company, The: *See*—
Wear, George H., 4,213,891, Cl. 260-45.75S.
Geren, Keith E.; Sauer, Warren A.; and Young, Donald A., to United States of America, Navy. Multiple sonar masking and jamming countermeasure system. 4,214,313, Cl. 367-1.000.
Geretzki, Helmut, to Windmoller & Holscher. Gearing for driving a plate cylinder of a printing press at a non-uniform speed. 4,213,388, Cl. 101-216.000.
Gerhardt, Kyle D. Wind engine. 4,213,737, Cl. 416-41.000.
Ghafghaichi, Majid: *See*—
Dalal, Hormazdyar M.; Ghafghaichi, Majid; Kasprzak, Lucian A.; and Wimpfheimer, Hans, 4,214,256, Cl. 357-71.000.
Giallorenzi, Thomas G.: *See*—
Milton, A. Fenner; and Giallorenzi, Thomas G., 4,213,670, Cl. 350-96.160.
Gibbs, Dale S.: *See*—
Klingler, Thomas C.; Wessling, Ritchie A.; and Gibbs, Dale S., 4,214,096, Cl. 560-147.000.
Gibson, John D. Self tripping dammer. 4,213,502, Cl. 172-1.000.
Giilck, Lawrence J.; and Lojek, John S., to Uniroyal Ltd. Herbicidal concentrate containing ketone and amide solvents. 4,213,776, Cl. 71-117.000.
Gilhooly, James E. Multiple firmness multiple sleeper mattress. 4,213,214, Cl. 5-464.000.
Giller, Henricus F. J. I.; and T'Jampens, Germain R., to U.S. Philips Corporation. Tungsten/bromine cycle lamp. 4,213,662, Cl. 316-24.000.
Gillich, Thomas N.: *See*—
Walls, John E.; and Gillich, Thomas N., 4,213,887, Cl. 260-29.60E.
Gillot, Gary W.; and Wright, David H. Setting apparatus. 4,213,680, Cl. 354-12.000.
Gimaev, Nasikh Z.: *See*—
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,213,834, Cl. 204-129.250.
Givaudan Corporation: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,214,002, Cl. 424-300.000.
Glasrock Products, Inc.: *See*—
Morris, Harold B., 4,213,816, Cl. 156-245.000.
Gliemeroth, Georg: *See*—
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,786, Cl. 106-47.00Q.
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,787, Cl. 106-47.00Q.
Globol-Werk GmbH: *See*—
Schimanski, Georg, 4,214,146, Cl. 219-274.000.
Goebel, Charles V., Jr., to Polymer Corporation, The. Reinforced polylactams. 4,214,065, Cl. 528-27.000.
Goerth, Joachim, to U.S. Philips Corporation. Semiconductor device having a MOS-capacitor. 4,214,252, Cl. 357-23.000.
Goff, Willie, Jr.: *See*—
Firth, Rowland V. D., III; and Goff, Willie, Jr., 4,213,575, Cl. 242-57.000.
Gold, Vance B.; and Vandlik, Robert P., to American Can Company. Thickness gauge. 4,213,319, Cl. 72-34.000.
Goldberg, Bruce S.; and Shah, Mahendra, to Amerace Corporation. Continuous process for producing, by irradiation, a microporous rubber composition suitable for battery separators. 4,213,815, Cl. 156-244.110.
Goldmann, Wolf: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.
Goldstein, Alma W.; and Fager, Earl E. C., to Abbott Laboratories. Fortimicin A1. 4,214,078, Cl. 536-17.00R.
Golovnin, Vladimir M.: *See*—
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.
Gomori, Janos. Incineration plant. 4,213,403, Cl. 110-216.000.
Gondek, John T. Hydraulic coupler. 4,213,482, Cl. 137-614.010.
Gongwer, Calvin A., to Innerspace Corporation. Turbomachinery and method of operation. 4,213,736, Cl. 415-182.000.
Goodman, David S.; and Stanfield, George I., to International Telephone and Telegraph Corporation. Electrical contact. 4,213,668, Cl. 339-217.00R.
Goodnight, Hershel E.; and Witwer, Alan D., to John Zink Company. Apparatus for use in conjunction with boiler flue gases for generating inert blanketing gases. 4,213,935, Cl. 422-111.000.
Goodrich, Richard B.; and Moulton, Richard J., to Hexcel Corporation. Method for increasing the surface tack of prepreg materials. 4,213,930, Cl. 264-135.000.
Gore, Thomas: *See*—
Absler, Howard; Juszak, Joseph; and Gore, Thomas, 4,213,639, Cl. 282-11.50A.
Gose, Horst: *See*—
Bromer, Gunter; Gose, Horst; Hoffmann, Klaus-Rudiger; and Seeliger, Christian, 4,214,192, Cl. 318-573.000.
Gosteli, Jacques, to Ciba-Geigy Corporation. Process for the production of substituted benzaldehydes. 4,213,920, Cl. 568-424.000.
Gotaverken Anteknik AB: *See*—
Lis, Per-Arne; and Olausson, Karl A., 4,213,405, Cl. 110-234.000.
Gotz, Menfred K.: *See*—
Immer, Hans U.; Nelson, Verner R.; and Gotz, Menfred K., 4,213,895, Cl. 260-112.50R.
Gould Inc.: *See*—
DiMarco, Bernard; and Hempstead, John C., 4,214,219, Cl. 335-23.000.
Gray, Keith I., 4,214,118, Cl. 174-15.0BH.
Strybel, Richard V., 4,213,216, Cl. 7-170.000.
Graham, Alan A.: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,214,028, Cl. 428-159.000.
Graham Magnetics Incorporated: *See*—
Cosby, Phillip A., 4,213,223, Cl. 15-304.000.
Graham, Robert H.; and Campbell, Barry D., to Molson Companies Limited, The. Apparatus for unscrambling and erecting a plurality of non-vertical bottles. 4,213,526, Cl. 198-400.000.
Grammueller, Harald: *See*—
Baier, Walter P.; and Grammueller, Harald, 4,214,209, Cl. 375-1.000.
Granger, Maurice. Apparatus for the cutting and simultaneous dispensing of a web of roll material. 4,213,363, Cl. 83-298.000.
Grantz, Helmut: *See*—
Andres, Rudolf; Grantz, Helmut; Abersfelder, Gunter; and Busch, Gerhard, 4,213,581, Cl. 242-107.40R.
Granzer, Ernold: *See*—
Gebert, Ulrich; and Granzer, Ernold, 4,213,994, Cl. 424-273.00R.
Graphic Controls Corporation: *See*—
Osenkarski, Paul D., 4,213,463, Cl. 128-639.000.
Grasselli, Robert K.: *See*—
Dolhyj, Serge R.; Suresh, Dev D.; and Grasselli, Robert K., 4,213,917, Cl. 260-465.00D.
Gravi-Mechanics Co.: *See*—
Dedolph, Richard R., 4,213,273, Cl. 47-74.000.
Gray, Keith I., to Gould Inc. Electrical bushing. 4,214,118, Cl. 174-15.0BH.
Gray, Stanley, to Mechanical Technology Incorporated. Compliant hydrodynamic bearing with tubular support element. 4,213,657, Cl. 308-9.000.
Grayson, Basil T.: *See*—
Davies, John H.; Grayson, Basil T.; and Rosinger, Herbert P., 4,213,916, Cl. 260-465.00D.
Great Lakes Chemical Corporation: *See*—
Garman, John A.; and Mamuzic, Rastko, 4,214,103, Cl. 568-639.000.
Grebe, Klaus; and De Haas, Hans, to Mannesmann Aktiengesellschaft. Making iron powder having fiber-like particles. 4,213,777, Cl. 75-0.5BA.
Green, John D.: *See*—
Horsewell, Henry G.; Green, John D.; Luke, John A.; and Harrison, Raymond J., 4,213,470, Cl. 131-261.00B.
Greene, Malbone W.: *See*—
Haunold, Otto; and Greene, Malbone W., 4,213,703, Cl. 356-244.000.
Gregory, Francis J.: *See*—
Fenichel, Richard L.; Wei, Peter H. L.; Gregory, Francis J.; and Alburn, Harvey E., 4,214,089, Cl. 548-151.000.
Grenia, James D., to Bechtel International Corporation. Method of mining of thick seam materials. 4,213,653, Cl. 299-11.000.
Grennan, Charles W., to Chandler Evans Inc. Constant flow centrifugal pump. 4,213,735, Cl. 415-21.000.
Grise, Frederick G. J.: *See*—
Kelley, John S.; Grise, Frederick G. J.; and Lovell, Walter C., 4,213,324, Cl. 72-405.000.
Grishin, Vladimir D.: *See*—
Talroze, Viktor L.; Grishin, Vladimir D.; and Galushkin, Boris A., 4,214,161, Cl. 250-303.000.
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., to Microlife Technics, Inc. Lactic acid fermentate flavored pet food. 4,214,008, Cl. 426-53.000.
Groff, William R.: *See*—
Carp, Ralph W.; and Groff, William R., 4,214,236, Cl. 340-642.000.
Grogg, Charles J., Sr. Amusement vehicle. 4,213,269, Cl. 46-219.000.
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Cosmetic compositions for treating the hair. 4,213,960, Cl. 424-47.000.
Grombone, Anthony: *See*—
Cunningham, Joseph E., Jr.; and Grombone, Anthony, 4,214,234, Cl. 340-347.0AD.
Gros, Harold J.: *See*—
Karg, Rudolph F.; and Gros, Harold J., 4,213,888, Cl. 260-33.6AQ.
Grosko, John A.: *See*—
Friend, Donald L.; Grosko, John A.; and Liniger, Richard B., II, 4,213,829, Cl. 202-263.000.
Groupe Minier Sullivan Ltee/Sullivan Mining Group Ltd.: *See*—
Thornton, Edward W. J., 4,213,942, Cl. 423-53.000.
Gryczka, Alfred J.: *See*—
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,214,008, Cl. 426-53.000.
GTE Laboratories Incorporated: *See*—
Lambert, Gary M., 4,213,671, Cl. 350-96.210.
GTE Products Corporation: *See*—
Brown, Timothy W., 4,214,273, Cl. 358-188.000.
Crosby, Alton L.; and Swank, Harry R., 4,214,142, Cl. 219-86.250.
GTE Sylvania Wiring Devices Incorporated: *See*—
Wittes, James M., 4,213,667, Cl. 339-103.00R.

Wittes, James M.; and Tibolla, Julius F., 4,213,669, Cl. 339-272.0UC.
Gudelis, Drasutis; and Vetrane, David D., to Nida Corporation. Electronic teaching and testing device. 4,213,253, Cl. 35-19.00A.
Gudorf, James L., to Mead Corporation, The. Method of forming a lead to an electrode on a charge plate. 4,213,238, Cl. 29-878.000.
Guebert, Gerald E.; and Belknap, Raymond R. Drapery rod clip. 4,213,492, Cl. 160-124.000.
Gueret, Jean-Louis H.; and Adams, Nancy, to L'Oreal. Finger mountable makeup applicator. 4,213,472, Cl. 132-88.700.
Guest, Ashley W., to British Aircraft Corporation. Radio receiving and retransmitting apparatus with frequency lock circuit. 4,214,205, Cl. 455-20.000.
Guibet, Jean-Pierre, to Air Industrie. Filter and method of making. 4,213,771, Cl. 55-483.000.
Guillaume, Jacques: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,213,989, Cl. 424-263.000.
Gulf Oil Corporation: *See*—
Gehrig, Neil E.; and Marhofer, Edwin G., 4,213,809, Cl. 149-60.000.
Gunners, Nils-Erik; Hellgren, Rune V.; and Liljergren, Torsten. Gun projectile arranged with a base drag reducing system. 4,213,393, Cl. 102-49.300.
Gustavsson, Stig I.: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.
Gustner, Harold L.: *See*—
Davis, Michael D.; and Gustner, Harold L., 4,213,744, Cl. 417-310.000.
Gutierrez, William S.: *See*—
Jacobson, Kenneth E.; and Gutierrez, William S., 4,214,179, Cl. 310-68.00B.
Gwin, Richard B.: *See*—
Lively, Steven A.; and Gwin, Richard B., 4,213,357, Cl. 82-4.00C.
Gyori, Robert P., to De luxe General, Incorporated. Plural phase pulsed power supply. 4,214,171, Cl. 307-39.000.
H. C. Price Co.: *See*—
Harris, Robert J.; and Sikes, Gail T., 4,213,530, Cl. 206-447.000.
Lively, Steven A.; and Gwin, Richard B., 4,213,357, Cl. 82-4.00C.
Haagen, Victor: *See*—
Mesens, Jean; and Haagen, Victor, 4,213,963, Cl. 424-80.000.
Haapala, Ray E. Cake layer cutter. 4,213,241, Cl. 30-115.000.
Haas, Georges: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,213,980, Cl. 424-246.000.
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, to Ciba-Geigy Corporation. Acyl-benzimidazole-2-methanol derivatives. 4,213,993, Cl. 424-273.00B.
Habiger, Cyril W., to Caterpillar Tractor Co. Single handle control apparatus. 4,213,484, Cl. 137-636.100.
Hacker, Heinz: *See*—
Aulich, Hubert; Douklias, Nikolaos; Hacker, Heinz; and Zeidler, Guenter, 4,213,672, Cl. 350-96.230.
Hadley, Michael S.; and Watts, Eric A., to Beecham Group Limited. Treating gastro-intestinal disorders and emesis with n-(heterocyclic substituted) benzamides. 4,213,983, Cl. 424-250.000.
Haese, Egon; Moll, Hans; and Willms, Rolf, to Dr. C. Otto & Comp. G.m.b.H. Process and apparatus to purify waste industrial gases. 4,213,945, Cl. 423-240.000.
Hafner, Hans W., to Pfister GmbH. Hydrostatic setting apparatus for support of loads. 4,213,509, Cl. 177-199.000.
Hafner & Krullmann GmbH: *See*—
Hafner, Manfred, 4,213,536, Cl. 220-82.00R.
Hafner, Manfred, to Hafner & Krullmann GmbH. Container for convoluted wire or the like. 4,213,536, Cl. 220-82.00R.
Haftmann, Johannes; and Schmeykal, Rudolf, to Nixdorf Computer AG. Ink ribbon cartridge having a replaceable ribbon magazine. 4,213,715, Cl. 400-196.100.
Haga, Ryoichi: *See*—
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,213,857, Cl. 210-6.000.
Hagen, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Pneumatically suspended bus. 4,213,625, Cl. 280-43.230.
Hagmueller, Artie: *See*—
Olberz, Norbert J.; and Hagmueller, Artie, 4,213,255, Cl. 36-32.00R.
Hahn, Erwin; Magerkurth, Bernhard; Lach, Dietrich; and Wuertele, Lothar, to BASF Aktiengesellschaft. Deliming of hides. 4,213,760, Cl. 8-94.170.
Hahn, Erwin: *See*—
Daubach, Ewald; Horn, Dieter; Hahn, Erwin; and Uhrig, Herbert, 4,213,900, Cl. 260-208.000.
Haigh, Daniel H.: *See*—
Hall, Richard H.; Haigh, Daniel H.; and Hansen, Robert D., 4,213,831, Cl. 203-86.000.
Hajimoto, Yoshioki: *See*—
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, 4,214,249, Cl. 346-76.00L.
Hake, Kenneth A., to Kent Manufacturing Co., Inc. Drag harrow pressure adjusting device. 4,213,506, Cl. 172-624.000.
Halasz, Peter R., to Bergen-Brunswig Corporation. Compact sanitary kit package. 4,213,598, Cl. 206-45.140.
Halfhill, Martin O.; and Jacques, James O., to Xerox Corporation. Method and apparatus for recording data without recording on defective areas of a data recording medium. 4,214,280, Cl. 360-53.000.
Hall, A. Douglass. Container opener. 4,213,215, Cl. 7-152.000.
Hall, Marcus A.; and Kutnyak, Thomas A., to Automation Industries, Inc. Continuously advancing mandrel. 4,213,811, Cl. 156-195.000.
Hall, Richard H.; Haigh, Daniel H.; and Hansen, Robert D., to Dow Chemical Company, The. Aluminum container for processing vinylbenzyl chlorides. 4,213,831, Cl. 203-86.000.
Hall, Robert E. Adjustable mailbox standard. 4,213,560, Cl. 232-39.000.
Hall, Robert N., to General Electric Company. Radiation detector. 4,214,253, Cl. 397-29.000.
Hallock, Robert L. Sheet metal nail with lockable legs. 4,213,373, Cl. 85-11.000.
Halon, Bernard; and Hoffman, Dorothy M., to RCA Corporation. Method for making adherent pinhole free aluminum films on pyroelectric and/or piezoelectric substrates. 4,214,018, Cl. 427-100.000.
Hamada, Kouzo: *See*—
Inokuchi, Nobuyuki; and Hamada, Kouzo, 4,213,635, Cl. 280-737.000.
Hamparian, Nshan, to General Motors Corporation. Engine with wall rib oil gauge mounting and drain means. 4,213,441, Cl. 123-196.00R.
Hanadate, Hitoshi: *See*—
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, 4,214,249, Cl. 346-76.00L.
Handa, Masahiro: *See*—
Takeuchi, Masayuki; Nakamura, Kenji; and Handa, Masahiro, 4,213,288, Cl. 56-11.600.
Handa, Ryozo: *See*—
Hase, Yoshinobu; Yamauchi, Masaaki; and Handa, Ryozo, 4,214,007, Cl. 426-44.000.
Hanessian, Stephen: *See*—
Carney, Ronald E.; and Hanessian, Stephen, 4,214,077, Cl. 536-17.00R.
Hanji, Shigeo: *See*—
Fujino, Teruhisa; Osawa, Fujio; Nagao, Noriaki; and Hanji, Shigeo, 4,214,245, Cl. 343-103.000.
Hannoschock, Kurt: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, 4,213,552, Cl. 226-170.000.
Hansen, Robert D.: *See*—
Hall, Richard H.; Haigh, Daniel H.; and Hansen, Robert D., 4,213,831, Cl. 203-86.000.
Hapgood, John H., to United States of America, Army. Video highlight attenuation processor. 4,214,272, Cl. 358-170.000.
Harder, Joseph R.: *See*—
Rakes, James L.; and Harder, Joseph R., 4,214,030, Cl. 428-212.000.
Hardern, David N.: *See*—
Bantick, John R.; Hardern, David N.; and Lee, Thomas B., 4,213,903, Cl. 548-250.000.
Hardesty, Robert D., to Pottratz, Tom; Pottratz, Ronald, Jr.; and Advanced Design and Construction. Pulling hitch for agricultural implements. 4,213,628, Cl. 280-412.000.
Harding, Homer R.: *See*—
Schane, Harry P., Jr.; Harding, Homer R.; and Creange, John E., 4,213,977, Cl. 424-241.000.
Hardy, Albert L., to General Electric Company. Liquid level indicator. 4,213,338, Cl. 73-299.000.
Hardy, Ronald G.: *See*—
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,800, Cl. 148-2.000.
Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,799, Cl. 148-2.000.
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, to Bayer Aktiengesellschaft. Anthraquinone reactive dyestuffs. 4,214,082, Cl. 544-189.000.
Harris, Robert J.; and Sikes, Gail T., to H. C. Price Co. Containerized pipe coating material. 4,213,530, Cl. 206-447.000.
Harrison, Frank. Vehicle radiator cleaning and testing system. 4,213,474, Cl. 134-102.000.
Harrison, Raymond J.: *See*—
Horsewell, Henry G.; Green, John D.; Luke, John A.; and Harrison, Raymond J., 4,213,470, Cl. 131-261.00B.
Hartley, E. Dale, to Product Research and Development. Pressure switch with snap element. 4,214,137, Cl. 200-83.00P.
Hartmann, Karl. Process for production of individual portions from blocks of deep-frozen foodstuffs. 4,213,360, Cl. 83-15.000.
Hartwell Corporation: *See*—
Poe, L. Richard; and Bourne, William R., 4,213,642, Cl. 292-241.000.
Harvard College, President and Fellows: *See*—
Stulen, Foster B., 4,213,466, Cl. 128-733.000.
Stulen, Foster B.; and De Luca, Carlo, 4,213,467, Cl. 128-733.000.
Hasbro Industries, Inc.: *See*—
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., 4,213,266, Cl. 46-1.00R.
Hase, Yoshinobu; Yamauchi, Masaaki; and Handa, Ryozo, to Kanebo Foods, Ltd. Processed dried beans as instant food and their manufacturing method. 4,214,007, Cl. 426-44.000.
Hattis, Russell E.; and Yan, Chan K., to W. Haking Enterprises Limited. Film advancing mechanism. 4,213,687, Cl. 354-213.000.
Hattori, Akira: *See*—
Nara, Yasuhiro; Sohma, Yukio; and Hattori, Akira, 4,214,228, Cl. 371-40.000.

Haugland, Richard P. Fluorescent labeling reagents containing the fluorescein and eosin chromophores. 4,213,904, Cl. 260-326.5CA.

Haunold, Otto; and Greene, Malbone W., to Beckman Instruments, Inc. Photometer with stationary sample holder and rotatable shutter. 4,213,703, Cl. 356-244.000.

Hauser, Raimund: *See*—
Keznickl, Eduard; and Boehm, Kurt, 4,214,268, Cl. 358-127.000.

Hawkins, Larry L., to General Electric Company. Temperature compensation for clothes dryer timer selectors. 4,213,250, Cl. 34-53.000.

Hawkins, Royal R.: *See*—
Elmberg, Dwayne R.; and Hawkins, Royal R., 4,213,503, Cl. 172-4.500.

Haworth Mfg., Inc.: *See*—
Haworth, Richard G., 4,213,493, Cl. 160-351.000.

Haworth, Richard G., to Haworth Mfg., Inc. Fabric retainer for panel. 4,213,493, Cl. 160-351.000.

Hayashi, Akira; Ohkouchi, Haruo; Kitano, Kyozo; and Ogoshi, Toshiaki, to Lion Fat & Oil Co., Ltd., The. Process for producing clear aqueous solution of olefin sulfonic acid. 4,213,918, Cl. 260-513.00T.

Hayashi, Yoshimasa: *See*—
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,213,440, Cl. 123-195.00C.

Hayata, Toshinori; Tsuji, Kunio; and Mitsui, Hajime, to West Electric Co., Ltd. Flash camera. 4,213,681, Cl. 354-21.000.

Hayward, Gary G.: *See*—
Raymond, Samuel O.; and Hayward, Gary G., 4,213,329, Cl. 73-52.000.

Hayward, John S.; Snavely, Benjamin B.; and Tschang, Pin S., to Eastman Kodak Company. Hybrid color image sensing array. 4,214,264, Cl. 358-44.000.

Headley, Kenneth N., to Hooker Chemicals & Plastics Corporation. Flash drying sludge derived fuel process. 4,213,407, Cl. 110-346.000.

Heberger, John M., to American Hoechst Corporation. Antistatic coated polyester film. 4,214,035, Cl. 428-340.000.

Hebert, Raymond T. Thermosiphon solar space heating system with phase change materials. 4,213,448, Cl. 126-434.000.

Heckelsberg, Robert E., to AMCA International Corporation. Metal panel roofing structure. 4,213,282, Cl. 52-404.000.

Hedger, John H. Reciprocating engine with improved power output means. 4,213,377, Cl. 91-187.000.

Hedrick, Edward F.: *See*—
Fremont, Henry A.; and Hedrick, Edward F., 4,213,947, Cl. 423-245.000.

Heeb, Othmar: *See*—
Maier, Elmar; and Heeb, Othmar, 4,213,301, Cl. 60-407.000.

Hefty, Arpad: *See*—
Hefty, Bela; and Hefty, Arpad, 4,213,212, Cl. 4-243.000.

Hefty, Bela; and Hefty, Arpad, to Hygomat AG. Arrangement for fitting and changing a tubular cover made of plastic film on a toilet seat, and method for forming a tube. 4,213,212, Cl. 4-243.000.

Heijmen, Hendricus J.: *See*—
de Jong, Aaldert J.; and Heijmen, Hendricus J., 4,214,098, Cl. 560-231.000.

Hellberg, Bjorn I.: *See*—
Fak, Viiveke; Ingemarsson, Ingemar B.; Blom, Rolf; Forchheimer, Robert; and Hellberg, Bjorn I., 4,214,230, Cl. 340-149.00A.

Hellgren, Rune V.: *See*—
Gunners, Nils-Erik; Hellgren, Rune V.; and Liljergren, Torsten, 4,213,393, Cl. 102-49.300.

Helmer, Warren D.; and Small, Robert E., to Campbell Soup Company. Mechanical deboning of poultry. 4,213,229, Cl. 17-46.000.

Hempstead, John C.: *See*—
DiMarco, Bernard; and Hempstead, John C., 4,214,219, Cl. 335-23.000.

Hendricks, Laurel A. Sanitary napkin. 4,213,813, Cl. 156-226.000.

Henkel Inc.: *See*—
Leenders, Peter, 4,214,102, Cl. 562-564.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,213,758, Cl. 8-409.000.

Henshaw, Terry L., to Union Pump Company. Modified volute pump casing. 4,213,742, Cl. 417-206.000.

Hentze, Gunter, to Bayer Aktiengesellschaft. Furnace heated by radiation. 4,214,117, Cl. 13-31.00R.

Herbst, LeRoy J.: *See*—
Kiefer, George E.; and Herbst, LeRoy J., 4,213,313, Cl. 68-12.00R.

Hercules Incorporated: *See*—
Miltenberger, Louis E., 4,213,566, Cl. 239-265.430.

Herder, N.V.: *See*—
Demrick, Carl J., 4,213,226, Cl. 16-36.000.

Herendi, Jozsef: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Herman Miller, Inc.: *See*—
Propst, Robert L.; Randolph, Travis M.; and Reyda, Theodore M., 4,214,298, Cl. 362-253.000.

Herriott, Donald R.: *See*—
Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., 4,213,698, Cl. 355-77.000.

Hess, Donald T., to Cain Encoder Company. Error correction in a remote meter reading device. 4,214,152, Cl. 235-92.0EC.

Hewing, Gunter: *See*—
Forster, Siegfried; Hewing, Gunter; and Kleemann, Manfred, 4,213,297, Cl. 60-39.51R.

Hewlett-Packard Company: *See*—
Mason, Martin K., 4,214,193, Cl. 318-611.000.

Hexcel Corporation: *See*—
Goodrich, Richard B.; and Moulton, Richard J., 4,213,930, Cl. 264-135.000.

Heynisch, Hinrich; and Krueger, Hans, to Siemens Aktiengesellschaft. Orientation layer for a liquid crystal display and method of manufacture. 4,213,810, Cl. 156-73.100.

Hibbard, Linda A., to Phoenix Products, Inc. Waterproof storage bag and backpack. 4,213,549, Cl. 224-209.000.

Hicks, D. Michelle. Body tethered ball game. 4,213,611, Cl. 273-414.000.

Hikosaka, Toshihisa: *See*—
Nakashima, Koichi; Nagaoka, Kiyosi; and Hikosaka, Toshihisa, 4,214,311, Cl. 364-482.000.

Hill, Henry A.; Figoski, John W.; and Ballard, Paul T., to University of Arizona Foundation, The. Background compensating interferometer. 4,213,706, Cl. 356-353.000.

Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, to Leybold-Heraeus GmbH. Apparatus for analyzing samples by electromagnetic irradiation. 4,214,159, Cl. 250-288.000.

Hilti Aktiengesellschaft: *See*—
Maier, Elmar; and Heeb, Othmar, 4,213,301, Cl. 60-407.000.

Hirahara, Katsuji, to FMC Corporation. Continuous pressure cooking method. 4,214,013, Cl. 426-629.000.

Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, to Sumitomo Aluminum Smelting Company, Ltd.; and Nihon Atsuen Kogyo K.K. Continuous casting and cladding process and apparatus for producing metal clad. 4,213,558, Cl. 228-176.000.

Hirokane, Tadashi: *See*—
Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, 4,213,558, Cl. 228-176.000.

Hishinuma, Yukio: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.

Hitachi, Ltd.: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.
Kimura, Shin; Fukui, Hiroshi; and Terasawa, Yoshio, 4,214,254, Cl. 357-38.000.
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.
Nakagaki, Harushige; Iwasaki, Syunji; and Fukushima, Isao, 4,214,299, Cl. 363-8.000.
Shimizu, Tsuguo; and Matsuura, Tsuguo, 4,214,304, Cl. 364-200.000.
Tokita, Yoshiaki; and Okajima, Keisuke, 4,214,305, Cl. 364-200.000.
Tsukada, Toshihisa, 4,213,805, Cl. 148-171.000.

HNT AG: *See*—
Husler, Balthasar, 4,213,374, Cl. 85-13.000.

Hocker, Eitel: *See*—
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, 4,213,236, Cl. 29-243.500.

Hoechst Aktiengesellschaft: *See*—
Freudenberger, Dieter; and Wunder, Friedrich, 4,214,106, Cl. 568-864.000.
Gebert, Ulrich; Musil, Josef; and Weber, Rolf-Ortwin, 4,213,986, Cl. 424-250.000.
Gebert, Ulrich; and Granzer, Ernold, 4,213,994, Cl. 424-273.00R.
Pistorius, Rudolf, 4,214,104, Cl. 568-648.000.

Hoefke, Wolfgang: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, 4,213,995, Cl. 424-273.00R.

Hoen, Cuyler, to Simmons Fastener Corporation. Rotatable locking fastener. 4,213,230, Cl. 24-217.00R.

Hof, Urs J.: *See*—
Dolezal, Zdenek; and Hof, Urs J., 4,213,292, Cl. 368-204.000.

Hofer, Peter; and Kohl, Wolfgang, to Titmus Eurocon Kontaklinsen GmbH & Co. KG. Method for surface treatment of contact lenses. 4,214,014, Cl. 427-40.000.

Hofer, Peter, to Purdue Frederick Company, The. Method for the production of iodophor powders. 4,214,059, Cl. 525-356.000.

Hoffman, Dorothy M.: *See*—
Halon, Bernard; and Hoffman, Dorothy M., 4,214,018, Cl. 427-100.000.

Hoffman, Jay, to Singer Company, The. Kinematic inertial sensor. 4,213,343, Cl. 73-505.000.

Hoffmann, Karl-Heinz, to Braun Aktiengesellschaft. Hand-held blow dryer with thumb-operable controls. 4,214,149, Cl. 219-370.000.

Hoffmann, Klaus-Rudiger: *See*—
Bromer, Gunter; Gose, Horst; Hoffmann, Klaus-Rudiger; and Seeliger, Christian, 4,214,192, Cl. 318-573.000.

Hoffmann-La Roche Inc.: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,214,002, Cl. 424-300.000.
Westley, John, 4,213,997, Cl. 424-283.000.

Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle. 4,213,568, Cl. 239-533.400.

Hohmann, Walter: *See*—
Berg, Gerhard; Hohmann, Walter; Reubke, Karl-Julius; and Wunderlich, Klaus, 4,213,909, Cl. 260-371.000.

Hold, Peter; Tadmor, Zehev; and Scharer, Hans R., to USM Corporation. Adjustable homogenization extruder. 4,213,710, Cl. 366-81.000.
Holderness, Eugene R., to Occidental Research Corporation. Conveyor apparatus for stacking and distributing comminuted material. 4,213,724, Cl. 414-133.000.
Holland, Redus F.: *See—*
Freund, Samuel M.; Maier, William B., II; Beattie, Willard H.; and Holland, Redus F., 4,213,836, Cl. 204-157.10R.
Hollander, James F. Light-emissive electrical measurement apparatus with floating inputs. 4,214,200, Cl. 324-122.000.
Hollister Incorporated: *See—*
Nolan, John L.; and Nordby, Harvey M., 4,213,458, Cl. 128-283.000.
Holtey, Thomas O.: *See—*
Joyce, Thomas F.; Holtey, Thomas O.; and Panepinto, William, Jr., 4,214,303, Cl. 364-200.000.
Holtkamp, Calvin J., to White Consolidated Industries, Inc. Multi-function self-cleaning oven thermostat. 4,214,224, Cl. 337-323.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Takeuchi, Masayuki; Nakamura, Kenji; and Handa, Masahiro, 4,213,288, Cl. 56-11.600.
Honda, Takeo: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Honeywell Inc.: *See—*
Elmberg, Dwayne R.; and Hawkins, Royal R., 4,213,503, Cl. 172-4.500.
Honeywell Information Systems Inc.: *See—*
Joyce, Thomas F.; Holtey, Thomas O.; and Panepinto, William, Jr., 4,214,303, Cl. 364-200.000.
Hoogovens Ijmuiden, B.V.: *See—*
Majoor, Hendrik, 4,213,577, Cl. 242-72.00R.
Hooker Chemicals & Plastics Corporation: *See—*
Headley, Kenneth N., 4,213,407, Cl. 110-346.000.
Hoppe, Rudy: *See—*
Bryant, Nelson; and Hoppe, Rudy, 4,213,702, Cl. 356-239.000.
Hoppe, Walter; and Typke, Dieter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Corpuscular beam microscope for ring segment focusing. 4,214,162, Cl. 250-311.000.
Hori, Tetsuo: *See—*
Yoneyama, Tetsuhito; Tomizawa, Shiro; Hori, Tetsuo; and Ojima, Teruhiko, 4,213,803, Cl. 148-102.000.
Horishima, Tohei: *See—*
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, 4,213,926, Cl. 264-74.000.
Horn, Dieter: *See—*
Daubach, Ewald; Horn, Dieter; Hahn, Erwin; and Uhrig, Herbert, 4,213,900, Cl. 260-208.000.
Horning, Thomas, to Data Products Corporation. Timing circuitry and method for a stepping motor. 4,214,194, Cl. 318-696.000.
Horowitz, Alexandre; and Cuypers, Martinus H., to Varitrac AG. Edge-active belt. 4,213,350, Cl. 474-264.000.
Horrer, Erwin; and Leidinger, Gustav. Grading vehicle. 4,213,507, Cl. 172-784.000.
Horsewell, Henry G.; Green, John D.; Luke, John A.; and Harrison, Raymond J., to British-American Tobacco Company Limited. Tobacco-smoke filters. 4,213,470, Cl. 131-261.00B.
Hosch, Carl A.; and Hosch, Michael L. Small animal holder. 4,213,424, Cl. 119-98.000.
Hosch, Michael L.: *See—*
Hosch, Carl A.; and Hosch, Michael L., 4,213,424, Cl. 119-98.000.
Hoshino, Tadayoshi; and Sudo, Yoichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Construction of stitching portions of gas bags. 4,213,634, Cl. 280-728.000.
Hotta, Toshihiro; and Makino, Takao, to Kabushiki Kaisha Morita Seisakusho. Device for detecting amount of X-ray radiation. 4,214,169, Cl. 250-505.000.
Houdaille Industries, Inc.: *See—*
De George, Robert P.; Brown, Paul R.; and Carbone, Victor T., 4,213,733, Cl. 414-751.000.
Hubele, Adolf: *See—*
Eckhardt, Wolfgang; Hubele, Adolf; and Kunz, Walter, 4,214,005, Cl. 424-309.000.
Frick, Willy; and Hubele, Adolf, 4,213,990, Cl. 424-269.000.
Huber, Rolf: *See—*
Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, 4,213,992, Cl. 424-273.00P.
Huber, Wolfgang: *See—*
Olschewski, Armin; and Huber, Wolfgang, 4,213,656, Cl. 308-8.200.
Hughes Aircraft Company: *See—*
Asawa, Charles K., 4,214,165, Cl. 250-338.000.
Sengstock, Paul J., Jr.; and Dutcher, Gerald L., 4,213,586, Cl. 244-158.000.
Hulsing, Kenneth L. Fuel injector. 4,213,564, Cl. 239-88.000.
Huni, Jean-Paul R.: *See—*
Dewing, Ernest W.; Huni, Jean-Paul R.; Sood, Raman R.; and Southam, Frederick W., 4,213,599, Cl. 266-166.000.
Hunt, Brian K.; and O'Donnell, Leopold H., to SCP Producer's Services Limited. Editing system for videotape sound. 4,214,278, Cl. 360-14.000.
Hunt, Harold R.; and Mills, King L., to Phillips Petroleum Company. Carbon black production. 4,213,957, Cl. 423-450.000.
Huppatz, John L., to Commonwealth Scientific and Industrial Research Organization. Fungicidal carboxamidopyrazoles. 4,214,090, Cl. 548-377.000.
Hurt, Frank K.; and Wellons, Edwin L., to Mefcor, Inc. Pump assembly driven by endless conveyor. 4,213,743, Cl. 417-229.000.
Husler, Balthasar, to HNT AG. Fastener. 4,213,374, Cl. 85-13.000.
Hutson, Thomas, Jr.: *See—*
Makovec, Donald J.; and Hutson, Thomas, Jr., 4,214,115, Cl. 585-716.000.
Hygomat AG: *See—*
Hefty, Bela; and Hefty, Arpad, 4,213,212, Cl. 4-243.000.
Hyland, Barbara B.: *See—*
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., 4,213,266, Cl. 46-1.00R.
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., to Hasbro Industries, Inc. Tumbling toy. 4,213,266, Cl. 46-1.00R.
Iba, Daizo: *See—*
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.
Ibata, Jyoji; Fukui, Hisaaki; Yuasa, Takeo; and Katoh, Michio, to Asahi Kasei Kogyo Kabushiki Kaisha. Sheet molding material. 4,214,026, Cl. 428-67.000.
ICI Americas Inc.: *See—*
Bristowe, William W.; Ford, Ernest C., Jr.; and Reed, Weldon N., 4,213,837, Cl. 204-159.190.
Igloo Corporation: *See—*
Buss, Kenton A., 4,213,310, Cl. 62-457.000.
Ignatov, Valentin B.: *See—*
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.
Iioka, Michihiro: *See—*
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.
Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for producing heat developable light-sensitive compositions and elements. 4,213,784, Cl. 430-616.000.
Imai, Chikara; Tatsumi, Susumu; and Eda, Tadahiro, to Ricoh Company, Ltd. Electrostatographic apparatus comprising improved developing bias control. 4,213,693, Cl. 355-14.00D.
Imamura, Takaaki; Kawagoe, Takahiro; Chikaraishi, Toshio; and Nyomura, Takashi, to Bridgestone Tire Company. Vulcanizable rubber composition containing metal organic compounds. 4,214,058, Cl. 525-348.000.
Immer, Hans U.; Nelson, Verner R.; and Gotz, Menfred K., to American Home Products Corporation. N-[N-[N-[N-[N-(5-Oxo-L-prolyl)-L-histidyl]-L-tryptophyl]-L-seryl]-L-tyrosyl]glycine azide, an intermediate of the releasing agent of luteinizing hormone (LW) and of follicle stimulating hormone (FSH). 4,213,895, Cl. 260-112.50R.
Imperial Chemical Industries Limited: *See—*
Bye, Ashley D., 4,213,878, Cl. 252-429.00B.
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., 4,213,899, Cl. 260-156.000.
Pinto, Alwyn, 4,213,954, Cl. 423-359.000.
Ridyard, Denis R. A.; and Taylor, Charles W., 4,213,759, Cl. 8-643.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Dipietromaria, Edoardo, 4,214,212, Cl. 455-190.000.
Indiana University Foundation: *See—*
Adams, William M.; Blakely, Robert F.; Ellis, Charles R.; and Mead, Judson, 4,214,238, Cl. 340-690.000.
Inductive Controls Limited: *See—*
Logan, Robert J., 4,214,195, Cl. 318-745.000.
Industrial & Municipal Engineering, Inc.: *See—*
Pearson, Leland E., 4,213,479, Cl. 137-493.000.
Ingemarsson, Ingemar B.: *See—*
Fak, Viiveke; Ingemarsson, Ingemar B.; Blom, Rolf; Forchheimer, Robert; and Hellberg, Bjorn I., 4,214,230, Cl. 340-149.00A.
Innerspace Corporation: *See—*
Gongwer, Calvin A., 4,213,736, Cl. 415-182.000.
Inokuchi, Nobuyuki; and Hamada, Kouzo, to Toyota Kodosha Kogyo Kabushiki Kaisha. Two-stage air bag system. 4,213,635, Cl. 280-737.000.
Inoue, Eiichi: *See—*
Miyakawa, Nobuhiro; Inoue, Eiichi; and Kokado, Hiroshi, 4,214,031, Cl. 428-213.000.
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, to Fuji Jokogyo Kabushiki Kaisha. Wheeled, overhead wire installing apparatus. 4,213,596, Cl. 254-134.30R.
Inoue, Takemi: *See—*
Sato, Masato; and Inoue, Takemi, 4,213,414, Cl. 115-73.000.
Insall, John N.; and Walker, Peter S., to New York Society for the Relief of the Ruptured and Crippled. Knee joint prosthesis. 4,213,209, Cl. 3-1.911.
Institut Francais du Petrole: *See—*
Douaud, Andre; and Rialan, Joseph, 4,213,429, Cl. 123-414.000.
Madec, Marcel; Espitalie, Jean; Laporte, Jean-Loup; and Barsony, Imre, 4,213,763, Cl. 23-230.0EP.
Institut Khimicheskoi Fiziki Akademii Nauk USSR: *See—*
Talroze, Viktor L.; Grishin, Vladimir D.; and Galushkin, Boris A., 4,214,161, Cl. 250-303.000.
International Business Machines Corporation: *See—*
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,214,315, Cl. 357-44.000.

Cunningham, Joseph E., Jr.; and Grombone, Anthony, 4,214,234, Cl. 340-347.0AD.
Dalal, Hormazdyar M.; Ghafghaichi, Majid; Kasprzak, Lucian A.; and Wimpfheimer, Hans, 4,214,256, Cl. 357-71.000.
Firth, Rowland V. D., III; and Goff, Willie, Jr., 4,213,575, Cl. 242-57.000.
Kuseski, Roger E., 4,213,694, Cl. 355-26.000.
Oswald, Richard K., 4,214,279, Cl. 360-51.000.
Sowter, Brian R.; and Warwick, William A., 4,214,221, Cl. 335-212.000.

International Harvester Company: *See*—
Biskis, Kestutis, 4,213,300, Cl. 60-420.000.
Rubenstein, Raymond D.; and Rescorla, Charles L., 4,213,511, Cl. 180-139.000.

International Minerals & Chemical Corporation: *See*—
Shipchandler, Mohammed T., 4,213,996, Cl. 424-274.000.

International Standard Electric Corporation: *See*—
Colin, Jean-Marie H., 4,214,242, Cl. 343-7.700.
Sterling, Henley F.; Bush, Eric L.; and McManus, Stephen J., 4,214,293, Cl. 361-433.000.

International Telephone and Telegraph Corporation: *See*—
Goodman, David S.; and Stanfield, George I., 4,213,668, Cl. 339-217.00R.

INTERx Research Corporation: *See*—
Bodor, Nicholas S.; and Sloan, Kenneth B., 4,213,978, Cl. 424-241.000.

Iowa State University Research Foundation, Inc.: *See*—
Kraus, George A., 4,214,092, Cl. 549-64.000.

Irontite Products, Inc.: *See*—
Roeschlaub, Ronald C.; and Fegel, Albert, 4,213,328, Cl. 73-49.700.

Irwin, Clarence C.; Manz, David F.; and Auman, John T., to General Motors Corporation. Linear locking seat belt retractor. 4,213,652, Cl. 297-478.000.

Isa, Hiroshi: *See*—
Mandai, Hiroshi; Tominaga, Anri; Yoshimura, Yoshikazu; and Isa, Hiroshi, 4,214,112, Cl. 585-532.000.

Isaki, Mikio: *See*—
Fushimi, Akihiro; Tabara, Noboru; and Isaki, Mikio, 4,214,283, Cl. 360-71.000.

Isbell, Arthur F., to Meiller Research, Inc. Synthesized scent. 4,213,875, Cl. 252-188.30R.

Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, to Agency of Industrial Science and Technology, The. Anaerobic digestion process. 4,213,857, Cl. 210-6.000.

Ishihara, Shunichi; and Katsube, Torsichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Coating composition for plastic substrates. 4,214,057, Cl. 525-100.000.

Ishikawa, Ro: *See*—
Sugimoto, Shigetoki; Ishikawa, Ro; and Matsushita, Shigeo, 4,213,677, Cl. 350-96.180.

Ishimoto, Akio: *See*—
Kiyono, Hiroshi; Ishimoto, Akio; Noda, Yoichiro; and Yada, Kozo, 4,213,925, Cl. 264-22.000.

Itek Corporation: *See*—
Ely, Richard R., 4,213,695, Cl. 355-45.000.

Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, to Onoda Cement Co., Ltd. Metallic squeeze-out tube with resinous layer on its surface. 4,213,541, Cl. 222-92.000.

ITT Industries, Incorporated: *See*—
Thompson, George H. B.; and Lovelace, David F., 4,213,808, Cl. 148-188.000.

Iwasaki, Syunji: *See*—
Nakagaki, Harushige; Iwasaki, Syunji; and Fukushima, Isao, 4,214,299, Cl. 363-8.000.

Iwase, Yoshitaka: *See*—
Kuwako, Tomohisa; Ozaki, Takashi; and Iwase, Yoshitaka, 4,214,180, Cl. 310-80.000.

Izuta, Mitugu: *See*—
Yasui, Yasuyosi; Izuta, Mitugu; and Okaguchi, Sigeki, 4,213,660, Cl. 308-177.000.

J. M. Huber Corporation: *See*—
Williams, Lloyd E.; and Mays, Robert K., 4,213,874, Cl. 252-174.250.

J & M Instruments Corp.: *See*—
Jungman, Maury, 4,213,841, Cl. 204-195.00R.

Jaakkola, Aarno, to Oy Lival AB. Joint means for light fittings, such as office lamps. 4,213,591, Cl. 248-281.100.

Jabsen, Felix S., to Babcock & Wilcox Company, The. Nuclear steam system containment. 4,213,824, Cl. 176-38.000.

Jackson, Clarence L. Spraying system. 4,213,565, Cl. 239-170.000.

Jackson, Earl G.: *See*—
Samour, Carlos M.; Jackson, Earl G.; Thomas, Samuel J.; and Davidson, Louie E., 4,213,486, Cl. 138-143.000.

Jackson, James F.: *See*—
Stookey, Gary K.; and Jackson, James F., 4,213,446, Cl. 126-192.000.

Jackson, Neville: *See*—
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., 4,213,899, Cl. 260-156.000.

Jackson, Theodore A., to Cadillac Gage Company. Storage and feeding apparatus for ammunition belts. 4,213,376, Cl. 89-34.000.

Jacobson, David N., to Monarch Marking Systems, Inc. Composite label web and method of making same. 4,214,024, Cl. 428-41.000.

Jacobson, Kenneth E.; and Gutierrez, William S., to Beckman Instruments, Inc. Rotor imbalance detector for a centrifuge. 4,214,179, Cl. 310-68.00B.

Jacobson, Stephen E.: *See*—
Mares, Frank; and Jacobson, Stephen E., 4,213,906, Cl. 260-343.000.

Jacques, James O.: *See*—
Halfhill, Martin O.; and Jacques, James O., 4,214,280, Cl. 360-53.000.

Jaeggi, Knut A.: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,213,980, Cl. 424-246.000.

Jager, Tilo: *See*—
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, 4,213,236, Cl. 29-243.500.

Jahn, Ulrich: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,214,095, Cl. 560-57.000.

Jakusch, Helmut: *See*—
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.

James, John P.: *See*—
Blake, Larry V.; Womeldorph, Donald E., Jr.; Surber, Oliver M.; and James, John P., 4,213,856, Cl. 209-250.000.

Jameson, M. Phillip, to Engelhard Minerals & Chemicals Corporation. Froth flotation. 4,213,853, Cl. 209-166.000.

Jamieson, Robert S. Method and apparatus for minimizing drag of plural-hull craft. 4,213,412, Cl. 114-61.000.

Jansen, Wilhelm: *See*—
Moser, Gottfried; and Jansen, Wilhelm, 4,213,519, Cl. 188-71.400.

Janssen Pharmaceutica N.V.: *See*—
Mesens, Jean; and Haagen, Victor, 4,213,963, Cl. 424-80.000.

Jarus, Daniel J., to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method and device for extracting a synchronizing signal from an incoming PCM signal. 4,214,124, Cl. 375-114.000.

Jay Boyce & Associates: *See*—
Boyce, Jay, 4,214,196, Cl. 318-811.000.

Jeco Co., Ltd.: *See*—
Nagahori, Yukihiro, 4,214,181, Cl. 310-162.000.

Jenaer Glaswerk Schott & Gen.: *See*—
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,786, Cl. 106-47.00Q.
Faulstich, Marga; Geiler, Volkmar; and Gliemeroth, Georg, 4,213,787, Cl. 106-47.00Q.

Jennings, Garman C. Back pack grinding apparatus. 4,213,276, Cl. 51-170.00R.

Jenoptik Jena G.m.b.H.: *See*—
Kuhn, Gebhard; and Meier, Ludwig, 4,214,297, Cl. 362-327.000.

Jerhammar, Lars-Olow. Navigational aid device for determining direction in a chart. 4,213,248, Cl. 33-431.000.

Jeumont-Schneider: *See*—
Lafaye, Jean P., 4,214,222, Cl. 336-84.00M.

Jocham, Rudolf: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,213,514, Cl. 180-308.000.

Johansson, Arne; and Larsson, Torsten, to Aktiebolaget Bofors. Securing member for wear parts for earth-moving machines. 4,213,257, Cl. 37-142.00R.

John Zink Company: *See*—
Goodnight, Hershel E.; and Witwer, Alan D., 4,213,935, Cl. 422-111.000.

Johns-Manville Corporation: *See*—
Kranich, Herbert, Jr., 4,213,882, Cl. 252-455.00R.

Johnson, Gary R., to Sperry Corporation. Printed circuit board guide spring. 4,214,292, Cl. 361-386.000.

Johnson & Johnson: *See*—
Papa, Christopher M., 4,214,000, Cl. 424-289.000.

Johnson, Ralph E., to Singer Company, The. Adjustable hook for a sewing machine. 4,213,410, Cl. 112-228.000.

Johnson, Richard D.: *See*—
Carrico, Robert J.; and Johnson, Richard D., 4,213,893, Cl. 260-112.50R.

Johnston, Wilbur D., Jr., to Bell Telephone Laboratories, Incorporated. Ohmic contact of N-GaAs to electrical conductive substrates by controlled growth of N-GaAs polycrystalline layers. 4,213,801, Cl. 148-33.300.

Jolley, Glenn L. Tractor implement carrying apparatus. 4,213,505, Cl. 172-510.000.

Jones, Barbara A., to Cuisinarts, Inc. Food processor with metering dispenser. 4,213,570, Cl. 241-38.000.

Jones, Charles E., to WMI Corporation. Molded plastic guitars. 4,213,370, Cl. 84-291.000.

Jones, Clifford M.; and Surber, William A., to General Electric Company. Printer having variable character density. 4,213,714, Cl. 400-124.000.

Jones, Frederick W. S.: *See*—
Cameron, Gordon M.; Jones, Frederick W. S.; and Nolan, Peter D., 4,213,958, Cl. 423-522.000.

Jones, George D., to Airco, Inc. System for detecting position of gauge pointer. 4,214,155, Cl. 250-231.00R.

Jones, George R.; and Raimondi, Peter K., to United States of America, Army. Technique for DC restoration in AC coupled display systems. 4,214,271, Cl. 358-166.000.

Jones, Kenneth R.: *See*—
Barlow, Paul; and Jones, Kenneth R., 4,214,300, Cl. 364-105.000.
Jones, Kenneth Robert: *See*—
Barlow, Paul; and Jones, Kenneth R., 4,214,300, Cl. 364-105.000.
Jones, William B., Jr., to General Electric Company. Face-pumped laser with diffraction-limited output beam. 4,214,216, Cl. 331-94.50C.
Jones, William T., Jr.; and Moulis, Edward J., to Western Electric Company, Inc. Electronic device package having solder leads and methods of assembling the package. 4,214,120, Cl. 174-52.0FP.
Joyce, Thomas F.; Holtey, Thomas O.; and Panepinto, William, Jr., to Honeywell Information Systems Inc. Word oriented high speed buffer memory system connected to a system bus. 4,214,303, Cl. 364-200.000.
June, Malcom N.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.
Jungman, Maury, to J & M Instruments Corp. pH Measuring instrument kit. 4,213,841, Cl. 204-195.00R.
Juszak, Joseph: *See*—
Absler, Howard; Juszak, Joseph; and Gore, Thomas, 4,213,639, Cl. 282-11.50A.
Jutte, Gottfried W.; and McHugh, John V., to Richardson Company, The. Container for a maintenance-free battery. 4,214,045, Cl. 429-87.000.
Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Rohner, Peter, 4,213,582, Cl. 242-110.000.
Kablikov, Vladislav A.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.
Kabushiki Kaisha Koden Seisakusho: *See*—
Fujino, Teruhisa; Osawa, Fujio; Nagao, Noriaki; and Hanji, Shigeo, 4,214,245, Cl. 343-103.000.
Kabushiki Kaisha Mino Seisakusho: *See*—
Mino, Masao; and Ohno, Takeshi, 4,213,574, Cl. 242-43.200.
Kabushiki Kaisha Morita Seisakusho: *See*—
Hotta, Toshihiro; and Makino, Takao, 4,214,169, Cl. 250-505.000.
Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,213,389, Cl. 101-295.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kawaharazaki, Takashi; Teraoka, Fuminori; Kubota, Tatsushi; and Matsui, Kenji, 4,213,580, Cl. 242-107.000.
Kuwako, Tomohisa; Ozaki, Takashi; and Iwase, Yoshitaka, 4,214,180, Cl. 310-80.000.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,213,651, Cl. 297-475.000.
Kadoya, Tetsuo: *See*—
Kodera, Yoshiaki; Watanabe, Kiyoyuki; Kadoya, Tetsuo; and Taguchi, Tadashi, 4,214,034, Cl. 428-315.000.
Kaessner, Hugo; and Loehr, Wilhelm, to Pfaudler Werke A.G. One piece agitator for closed vessel. 4,213,713, Cl. 366-279.000.
Kahn, Arthur R. Cooking machine. 4,213,380, Cl. 99-349.000.
Kaiser, Arthur, to CBS Inc. Television system for displaying and recording paths of motion. 4,214,263, Cl. 358-22.000.
Kaiser Steel Corporation: *See*—
Oswald, Donald E., 4,213,418, Cl. 118-635.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Reich, Heinrich; and Eibofner, Eugen, 4,213,756, Cl. 433-126.000.
Kamiya, Takashi; and Saito, Yoshihisa, to Fujisawa Pharmaceutical Co., Ltd. Substituted-phenyl substituted-alkyl ethers and the preparation thereof. 4,214,094, Cl. 560-42.000.
Kamiyama, Kouzi, to Fuji Photo Film Co., Ltd. Fluoride and phosphate containing optical glass. 4,213,788, Cl. 106-47.00Q.
Kamppinen, Holger. Fan device for rotary mowers. 4,213,289, Cl. 56-295.000.
Kanazawa, Hiroyuki, to Sumitomo Chemical Company, Limited. Process for producing a casting plate of polymethyl methacrylate. 4,214,064, Cl. 526-193.000.
Kanebo Foods, Ltd.: *See*—
Hase, Yoshinobu; Yamauchi, Masaaki; and Handa, Ryozo, 4,214,007, Cl. 426-44.000.
Kanervo, Seppo, to Oy Wartsila AB. Perforation method. 4,213,361, Cl. 83-30.000.
Kao Soap Co., Ltd.: *See*—
Miya, Bunji; and Kimura, Akio, 4,214,101, Cl. 562-421.000.
Karg, Rudolph F.; and Gros, Harold J., to Copolymer Rubber & Chemical Corporation. Particulate elastomeric materials and method. 4,213,888, Cl. 260-33.6AQ.
Karlsson, Birgitta G.: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Recording member for laser beam and process for recording. 4,214,249, Cl. 346-76.00L.
Kasprzak, Lucian A.: *See*—
Dalal, Hormazdyar M.; Ghafghaichi, Majid; Kasprzak, Lucian A.; and Wimpfheimer, Hans, 4,214,256, Cl. 357-71.000.
Kastin, Abba J.; and Coy, David H. Enkephalin derivatives. 4,213,968, Cl. 424-177.000.
Katata, Tetsuo, to Dai-Ichi Seiko Co., Ltd. Cassette tape reel. 4,213,578, Cl. 242-74.000.
Katoh, Michio: *See*—
Ibata, Jyoji; Fukui, Hisaaki; Yuasa, Takeo; and Katoh, Michio, 4,214,026, Cl. 428-67.000.
Katoh, Mitsumi: *See*—
Niimi, Koji; Katoh, Mitsumi; and Wachi, Masatada, 4,213,366, Cl. 84-1.010.
Katsube, Toraichi: *See*—
Ishihara, Shunichi; and Katsube, Toraichi, 4,214,057, Cl. 525-100.000.
Katsuno, Mitsuaki: *See*—
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,213,651, Cl. 297-475.000.
Katz, Louis; and Weil, Kurt W., to Sonometrics Systems, Inc. Transducer assembly. 4,213,464, Cl. 128-645.000.
Kaufmann, Meinolph, to BBC Brown Boveri & Company Limited. Liquid crystal display for reflection operation with a guest-host liquid crystal layer and method of making. 4,213,676, Cl. 350-336.000.
Kaufmann, Raimund: *See*—
Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,214,159, Cl. 250-288.000.
Kaveggia, Frederick S.: *See*—
Ashby, Robert M.; and Kaveggia, Frederick S., 4,213,866, Cl. 252-8.55C.
Kawagoe, Takahiro: *See*—
Imamura, Takaaki; Kawagoe, Takahiro; Chikaraishi, Toshio; and Nyomura, Takashi, 4,214,058, Cl. 525-348.000.
Kawaguchi, Yosio: *See*—
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.
Kawaharazaki, Takashi; Teraoka, Fuminori; Kubota, Tatsushi; and Matsui, Kenji, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt retractor. 4,213,580, Cl. 242-107.000.
Kawanami, Takao; Tajiri, Hiromi; and Uomori, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Steel Corporation. Conductor connector in flash welding apparatus. 4,214,143, Cl. 219-97.000.
Kawano, Shigeyoshi: *See*—
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Sato, Masato; and Inoue, Takemi, 4,213,414, Cl. 115-73.000.
Keck, Johannes: *See*—
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, 4,214,001, Cl. 424-300.000.
Keen, William A., Jr., to General Electric Company. Corrosive resistant seal for epoxy shell bushings, method of providing same, and gasket therefor. 4,214,119, Cl. 174-31.00R.
Kegler, William H.: *See*—
Sooter, Matthew C.; Becraft, Lloyd G.; and Kegler, William H., 4,213,846, Cl. 208-50.000.
Keim, Thomas A., to General Electric Company. Support structure for armature conductors. 4,214,182, Cl. 310-216.000.
Kelley, James K.: *See*—
Charneski, Mitchell D.; Kelley, James K.; and Gazdecki, Frank J., 4,214,121, Cl. 174-84.00C.
Kelley, John S.; Grise, Frederick G. J.; and Lovell, Walter C., to USM Corporation. Punch press and method for making can ends with closures. 4,213,324, Cl. 72-405.000.
Kellner, Ferdinand. Closeup focusing mechanism for an objective of long focal length. 4,213,686, Cl. 354-195.000.
Kelly, James P.: *See*—
Kreutz, George D.; Scott, L. J.; and Kelly, James P., 4,213,528, Cl. 206-205.000.
Kelso, Thomas W. Testing tools for modular telephone system. 4,214,132, Cl. 179-175.000.
Kemmerling, Gary. Seal remover. 4,213,235, Cl. 29-235.000.
Kendall Company, The: *See*—
Samour, Carlos M.; Jackson, Earl G.; Thomas, Samuel J.; and Davidson, Louie E., 4,213,486, Cl. 138-143.000.
Kennedy, Lawrence C.; and Kowalis, Joseph, to General Motors Corporation. Cylinder head gasket. 4,213,620, Cl. 277-235.00B.
Kent Manufacturing Co., Inc.: *See*—
Hake, Kenneth A., 4,213,506, Cl. 172-624.000.
Kern, Walter P., to Teradyne, Inc. Integrated circuit testing probe. 4,214,201, Cl. 324-158.00P.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Forster, Siegfried; Hewing, Gunter; and Kleemann, Manfred, 4,213,297, Cl. 60-39.51R.
Keznickl, Eduard; and Boehm, Kurt, to Vockenhuber, Karl; and Hauser, Raimund. Method and apparatus for video recording a film scan signal. 4,214,268, Cl. 358-127.000.
Khan, Irshad A.: *See*—
Cukier, Samuel; and Khan, Irshad A., 4,213,867, Cl. 252-8.750.
Khanna, Nirmal K.: *See*—
Zudkevitch, David; Khanna, Nirmal K.; and Raczynski, Robert F., 4,213,832, Cl. 203-95.000.
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F. Method for carrying out pyrolysis of hydrocarbon starting products. 4,214,113, Cl. 585-634.000.
Kicherer, Robert; and Schilling, Wilfried, to E.G.O. Regeltechnik GmbH. Control instrument for electric cooker plates. 4,214,151, Cl. 219-492.000.

Kiefer, George E.; and Herbst, LeRoy J., to General Electric Company. Relay control circuit for washing appliance. 4,213,313, Cl. 68-12.00R.

Kiehs, Karl: *See*—
Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, 4,213,992, Cl. 424-273.00P.
Loeffler, Hans-Peter; Adolphi, Heinrich; and Kiehs, Karl, 4,213,976, Cl. 424-224.000.

Kikuchi, Hideo: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.

Kimberly-Clark Corporation: *See*—
Sigl, Wayne C.; and LaBorde, Philip A., 4,213,459, Cl. 128-287.000.

Kimbrough, Mahlon D., to Reliance Telecommunication Electronics Company. Sideband cancellation circuit for a transmission line communications system receiver. 4,214,129, Cl. 370-57.000.

Kimura, Akio: *See*—
Miya, Bunji; and Kimura, Akio, 4,214,101, Cl. 562-421.000.

Kimura, Akira: *See*—
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,213,440, Cl. 123-195.00C.

Kimura, Shin; Fukui, Hiroshi; and Terasawa, Yoshio, to Hitachi, Ltd. Amplified gate semiconductor controlled rectifier with reduced lifetime in auxiliary thyristor portion. 4,214,254, Cl. 357-38.000.

Kindlmann, Peter J.: *See*—
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,213,496, Cl. 164-147.000.

King, William B. Safety barrier for a vehicle. 4,213,636, Cl. 280-749.000.

King, William F.: *See*—
Wheeler, Ronald E.; and King, William F., 4,213,973, Cl. 424-200.000.

Kiraly, Ernest F.: *See*—
Ferraro, Frank A.; and Kiraly, Ernest F., 4,213,240, Cl. 30-47.000.

Kirchgaesser, Johannes: *See*—
Pierron, Claude; and Kirchgaesser, Johannes, 4,213,589, Cl. 248-74.00R.

Kitagawa, Tsunehiro, to Dainippon Pharmaceutical Co., Ltd. Reagent suitable for enzyme immuno assay. 4,214,048, Cl. 435-7.000.

Kitajima, Hiroshi: *See*—
Komatsu, Seigi; and Kitajima, Hiroshi, 4,213,228, Cl. 17-11.000.

Kitamura, Takanori; and Tamura, Masuhiko, to Kuraray Co., Ltd. Method of producing olefin oligomers and hydrogenation products thereof. 4,214,111, Cl. 585-255.000.

Kitamura, Takashi: *See*—
Kasai, Masanao; Hanadate, Hitoshi; Hajimoto, Yoshioki; Kitamura, Takashi; and Endo, Kiyonobu, 4,214,249, Cl. 346-76.00L.

Kitano, Kyozo: *See*—
Hayashi, Akira; Ohkouchi, Haruo; Kitano, Kyozo; and Ogoshi, Toshiaki, 4,213,918, Cl. 260-513.00T.

Kiyono, Hiroshi; Ishimoto, Akio; Noda, Yoichiro; and Yada, Kozo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for continuously producing foamed sheets. 4,213,925, Cl. 264-22.000.

Kizaki, Jiro: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,213,535, Cl. 220-20.500.

Klasen, Charles J.: *See*—
Funk, Smith A.; Klasen, Charles J.; and Vilmanis, Ilmars, 4,213,487, Cl. 138-149.000.

Kleemann, Manfred: *See*—
Forster, Siegfried; Hewing, Gunter; and Kleemann, Manfred, 4,213,297, Cl. 60-39.51R.

Kley, Fitting, Fitting, Nalley and Smith: *See*—
Kley, Victor B., 4,214,122, Cl. 178-18.000.

Kley, Victor B., to Kley, Fitting, Fitting, Nalley and Smith. Resistive planar graphical entry device. 4,214,122, Cl. 178-18.000.

Klingler, Michael R. Manipulating rotary control device. 4,213,416, Cl. 116-309.000.

Klingler, Thomas C.; Wessling, Ritchie A.; and Gibbs, Dale S., to Dow Chemical Company, The. Novel isothiouronium salts. 4,214,096, Cl. 560-147.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Moser, Gottfried; and Jansen, Wilhelm, 4,213,519, Cl. 188-71.400.

Klotz, Arthur: *See*—
Blind, Karl; and Klotz, Arthur, 4,213,643, Cl. 292-247.000.

Knapek, Erwin: *See*—
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.

Knight, George W.; and Mach, Dennis E., to Dow Chemical Company, The. Hydrocarbon solutions of organomagnesium compounds. 4,213,880, Cl. 252-431.00R.

Knippel, Willis H., to Pullman Incorporated. Double locking door latch mechanism for railway hopper cars. 4,213,725, Cl. 414-387.000.

Knock, Harry A. Insulation gun. 4,213,490, Cl. 141-311.00R.

Knorr, Gunter, to Claudius Peters AG. Filling machine for valve bags. 4,213,287, Cl. 53-573.000.

Knowles, Warren D., to Singer Company, The. Readily attachable and detachable sole plate for a sewing machine. 4,213,411, Cl. 112-240.000.

Knox Manufacturing Co.: *See*—
Brown, Donald J., 4,213,260, Cl. 40-158.00B.

Knuaf, Alfons; Bold, Jorg; and Franke, Siegfried, to Gebr. Knauf Westdeutsche Gipswerke. Process for the production of fiber-containing plaster boards. 4,214,027, Cl. 428-113.000.

Kobayashi, Akio, to Nippondenso Co., Ltd. Electronic fuel injection control apparatus. 4,214,306, Cl. 364-431.000.

Kobayashi, Ryuji: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.

Kobe Steel, Ltd.: *See*—
Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toyohiko, 4,213,946, Cl. 423-242.000.
Okuda, Naoki; and Nakano, Akira, 4,214,141, Cl. 219-73.000.

Kochey, Edward L., to Combustion Engineering, Inc. Cooling means for a water-filled ash hopper. 4,213,402, Cl. 110-171.000.

Kockums Industri AB: *See*—
Casselbrant, Sven G., 4,213,928, Cl. 264-113.000.

Koda, Takao, to Fuji Photo Optical Co., Ltd. Folding type photographic camera. 4,213,685, Cl. 354-193.000.

Kodera, Yoshiaki; Watanabe, Kiyoyuki; Kadoya, Tetsuo; and Taguchi, Tadashi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Agricultural covering multilayer film or sheet structure and method for thermal insulation. 4,214,034, Cl. 428-315.000.

Koehler-Dayton, Inc.: *See*—
Weik, Kirby B., 4,213,593, Cl. 248-501.000.

Koester, Eberhard: *See*—
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.
Schoettle, Klaus; Dobler, Peter; Lewin, Helmut; and Koester, Eberhard, 4,213,222, Cl. 15-100.000.

Kohl, Wolfgang: *See*—
Hofer, Peter; and Kohl, Wolfgang, 4,214,014, Cl. 427-40.000.

Koide, Tsuyoshi; and Oda, Yasuji, to Toyoda-Koki Kabushiki-Kaisha. Numerical controller for controlling machining of oval workpiece. 4,214,309, Cl. 364-474.000.

Kojima, Mikio: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.

Kokado, Hiroshi: *See*—
Miyakawa, Nobuhiro; Inoue, Eiichi; and Kokado, Hiroshi, 4,214,031, Cl. 428-213.000.

Koltay, Sandor: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Komatsu, Akira: *See*—
Moroe, Tatsuo; Komatsu, Akira; Doi, Kiyosumi; and Moroe, Mitio, 4,214,110, Cl. 585-241.000.

Komatsu, Makoto; Ohta, Tazuo; Tanaka, Toru; and Akagi, Kimiko, to Mitsubishi Gas Chemical Company, Inc. Process for preventing blackening of phthalic acid. 4,214,100, Cl. 562-416.000.

Komatsu, Seigi; and Kitajima, Hiroshi, to Seigi Komatsu. Device for cutting off the neck meat of a fowl. 4,213,228, Cl. 17-11.000.

Kominek, Leo A.: *See*—
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,052, Cl. 435-55.000.

Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, to Sagami Chemical Research Center. Process for preparing dihalovinylcyclopropanecarboxylates. 4,214,097, Cl. 560-213.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Akiyama, Mistuo; and Abe, Shunichi, 4,213,692, Cl. 355-14.00D.

Konves, Richard L.: *See*—
Bryan, Henry A.; Martin, Walter H.; and Konves, Richard L., 4,213,423, Cl. 119-86.000.

Koppe, Herbert: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, 4,213,995, Cl. 424-273.00R.

Koppers Company, Inc.: *See*—
Cain, George R., 4,213,489, Cl. 141-70.000.

Koppl, Franz. Method for the transfer of heat. 4,213,830, Cl. 203-11.000.

Koshman, Vitaly I.; Nagorny, Mikhail A.; and Petrichenko, Vladimir F. Explosion-proof switchgear apparatus. 4,214,291, Cl. 361-338.000.

Kosinsky, Edward J., to Phillips Petroleum Company. Minimal blocking thermoplastic material and lubricating oil composition containing the same. 4,213,869, Cl. 252-37.500.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Siliceous dioxolane derivatives and their application to the manufacture of organosilane esters containing epoxy groups. 4,213,908, Cl. 260-348.160.

Kourimsky, Friedrich J. A., to AMP Incorporated. Fuse. 4,214,223, Cl. 337-293.000.

Kowalis, Joseph: *See*—
Kennedy, Lawrence C.; and Kowalis, Joseph, 4,213,620, Cl. 277-235.00B.

Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S. Apparatus for surfacing internal combustion engines valves. 4,214,139, Cl. 219-9.500.

Kraft, Inc.: *See*—
Davis, Paul F., 4,213,896, Cl. 260-119.000.

Kranich, Herbert, Jr., to Johns-Manville Corporation. Preparation method for catalyst support and materials produced thereby. 4,213,882, Cl. 252-455.00R.

Krapcho, John, to E. R. Squibb & Sons, Inc. Imino containing morpholine compounds. 4,214,081, Cl. 542-424.000.

Kraus, Bernd: *See*—
Peter, Cornelius; and Kraus, Bernd, 4,213,335, Cl. 73-204.000.

Kraus, George A., to Iowa State University Research Foundation, Inc. Rearrangement of acyloxy furans and thiophenes prepared from butenolides. 4,214,092, Cl. 349-64.000.

Krautheim, Leonard: *See*—
Bogert, Clayton; Alexander, John D.; and Krautheim, Leonard, 4,213,359, Cl. 82-47.000.

Krautkramer-Branson, Incorporated: *See*—
Rose, Joseph L., 4,213,344, Cl. 73-620.000.

Kraver, Richard A. Electric heating system for controlling temperature of pipes to prevent freezing and condensation. 4,214,147, Cl. 219-301.000.

Kreft, Wilfried: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Kreinick, Stephen J.: *See*—
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,232, Cl. 340-347.0AD.
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,233, Cl. 340-347.0AD.

Kremp, Richard E.; and Vandeman, Fred N. Process for removal of silver from photographic film. 4,213,782, Cl. 430-432.000.

Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Polymers of 2-ketopentafluoropropanesulfonic acid and related acids with ethylene or fluorinated unsaturated monomers. 4,214,070, Cl. 528-220.000.

Kretschmer, Alfred; Ruettiger, Wilhelm; and Wuerz, Albrecht, to BASF Aktiengesellschaft. Process for continuously washing a printed textile sheet-like structure. 4,213,217, Cl. 8-151.000.

Kretzer, Horst: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Kreutz, George D.; Scott, L. J.; and Kelly, James P., to Becton Dickinson & Company. Package for acid container. 4,213,528, Cl. 206-205.000.

Kreutzer, Peter K. Circuit for transistor ballasts for the gentle ignition of fluorescent lamps. 4,214,186, Cl. 315-102.000.

Krieger, Raymond L.; Weaver, Ralph W.; and Able, Edward T., to B. K. Sweeney Manufacturing Co. High torque multiplier and readout apparatus. 4,213,333, Cl. 73-136.00R.

Krishnan, Mithra S. Game racquets. 4,213,608, Cl. 273-73.00C.

Krob, Erwin; and Svoboda, Josef, to TMC Corporation. Brake for skis. 4,213,629, Cl. 280-605.000.

Krueger, Hans: *See*—
Heynisch, Hinrich; and Krueger, Hans, 4,213,810, Cl. 156-73.100.

Kruger: *See*—
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, 4,214,001, Cl. 424-300.000.

Krusic, Paul J.: *See*—
Apotheker, David; and Krusic, Paul J., 4,214,060, Cl. 525-387.000.

Kubota, Kikuo; Yamagishi, Yoshiaki; and Yamaguchi, Masaru, to Toyo Seikan Kaisha Limited. Rotary blow molding machine. 4,213,750, Cl. 425-531.000.

Kubota, Tatsushi: *See*—
Kawaharazaki, Takashi; Teraoka, Fuminori; Kubota, Tatsushi; and Matsui, Kenji, 4,213,580, Cl. 242-107.000.

Kudryavtsev, Lev A.: *See*—
Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A., 4,213,325, Cl. 73-1.00G.

Kuehne, Rudi: *See*—
Eggert, Hans-Joachim; Zenkert, Heinrich; Kuehne, Rudi; and Oberberger, Otto, 4,213,532, Cl. 206-504.000.

Kuhn, Gebhard; and Meier, Ludwig, to Jenoptik Jena G.m.b.H. Arrangement for spectral dispersion of a bundle of light. 4,214,297, Cl. 362-327.000.

Kuijt, Cornelis, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Switching device for letters and the like. 4,213,602, Cl. 271-279.000.

Kulik, Alphonse C., to USM Corporation. Wiper motion stop. 4,213,221, Cl. 12-12.400.

Kulka, Thomas S. Traffic light and motor vehicle taillight lenses. 4,214,168, Cl. 362-311.000.

Kumeta, Mitsuzo: *See*—
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, 4,213,596, Cl. 254-134.30R.

Kummer, Werner: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, 4,213,995, Cl. 424-273.00R.

Kunnen, Jan; and Van Der Schee, Abraham C., to Akzo N.V. Coating metal by immersion. 4,214,022, Cl. 427-435.000.

Kunz, Walter: *See*—
Eckhardt, Wolfgang; Hubele, Adolf; and Kunz, Walter, 4,214,005, Cl. 424-309.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Ring spinning frame with drawing mechanism stop motion. 4,213,290, Cl. 57-85.000.

Kuptsov, Nikolai F.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.

Kuraray Co., Ltd.: *See*—
Kitamura, Takanori; and Tamura, Masuhiko, 4,214,111, Cl. 585-255.000.

Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, to Hitachi, Ltd. Diagnostic device for use with automatic control systems. 4,214,301, Cl. 364-119.000.

Kurihara, Tadashi: *See*—
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.

Kuseski, Roger E., to International Business Machines Corporation. Copy production machines. 4,213,694, Cl. 355-26.000.

Kushnarenko, Valentin K.: *See*—
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.

Kushner, Jury K. Stabilized current sources network. 4,214,176, Cl. 307-297.000.

Kutnyak, Thomas A.: *See*—
Hall, Marcus A.; and Kutnyak, Thomas A., 4,213,811, Cl. 156-195.000.

Kuwako, Tomohisa; Ozaki, Takashi; and Iwase, Yoshitaka, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Miniature electric motor employing a conversion mechanism for linear movement. 4,214,180, Cl. 310-80.000.

LaBorde, Philip A.: *See*—
Sigl, Wayne C.; and LaBorde, Philip A., 4,213,459, Cl. 128-287.000.

Lach, Dietrich: *See*—
Hahn, Erwin; Magerkurth, Bernhard; Lach, Dietrich; and Wuertele, Lothar, 4,213,760, Cl. 8-94.170.

Lacroix, Paul: *See*—
Mas, Henri; and Lacroix, Paul, 4,213,256, Cl. 36-124.000.

Lafaye, Jean P., to Jeumont-Schneider. Improved clamping members in a horizontal magnetic core power transformer. 4,214,222, Cl. 336-84.00M.

Lagg, Jerry W. Turbine power generator. 4,213,734, Cl. 415-4.000.

Laitinen, Herbert A.; and Rosenfarb, Joseph, to University of Florida, Board of Regents, State of Florida, for the use and benefit of the. Preparation of platinum-coated substrates. 4,214,017, Cl. 427-92.000.

Laitram Corporation, The: *See*—
Lapeyre, James M.; and Lapeyre, Fernand S., 4,213,527, Cl. 198-853.000.

Lambert, Gary M., to GTE Laboratories Incorporated. Fiber optic connectors and methods of affixing optical fibers thereto. 4,213,671, Cl. 350-96.210.

Lamensdorf, David: *See*—
Cronson, Harry M.; Lamensdorf, David; and Ross, Gerald F., 4,214,248, Cl. 343-756.000.

Land, Edwin H., to Polaroid Corporation. Sound motion picture system having concentrated audio system. 4,214,285, Cl. 360-90.000.

Lane, William E. Sun tracking solar energy boiler. 4,213,303, Cl. 60-641.000.

Langdon, Roger M., to Marconi Company Limited, The. Liquid level sensing devices. 4,213,337, Cl. 73-290.00V.

Lange, Gerd: *See*—
Pietsch, Helge; and Lange, Gerd, 4,213,594, Cl. 248-550.000.

Lanzilloti, J. J. Lens testing apparatus and method. 4,213,701, Cl. 356-124.000.

Lapeyre, Fernand S.: *See*—
Lapeyre, James M.; and Lapeyre, Fernand S., 4,213,527, Cl. 198-853.000.

Lapeyre, James M.; and Lapeyre, Fernand S., to Laitram Corporation, The. Chain link conveyors. 4,213,527, Cl. 198-853.000.

Laporte, Jean-Loup: *See*—
Madec, Marcel; Espitalie, Jean; Laporte, Jean-Loup; and Barsony, Imre, 4,213,763, Cl. 23-230.0EP.

Larkin, John M.; Cullen, William P.; Sung, Rodney L.; and Zoleski, Benjamin H., to Texaco Inc. Process for decolorizing lubricating oil additives. 4,214,083, Cl. 544-277.000.

Larking, Ingrid: *See*—
Moretto, Hans-Heinrich; Steinberger, Helmut; Larking, Ingrid; and Sattlegger, Hans, 4,214,066, Cl. 528-28.000.

Larry, Ronald G. Shock distributing panel. 4,213,202, Cl. 2-2.000.

Larson, Larry L., to Dow Chemical Company, The. Insecticidal synergistic mixtures of O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl)phosphorothioate and O-ethyl O-(4-(methylthio)phenyl)-S-n-propyl phosphorothioate. 4,213,975, Cl. 424-200.000.

Larsson, Bernt: *See*—
Boberg, Anders; Larsson, Bernt; and Lundh, Folke, 4,213,885, Cl. 260-29.6TA.

Larsson, Torsten: *See*—
Johansson, Arne; and Larsson, Torsten, 4,213,257, Cl. 37-142.00R.

Laupman, Robert R., to Novanex Automation N.V. Speaker system. 4,213,515, Cl. 181-145.000.

Lava Crucible Refractories Co.: *See*—
Miller, Eldon D., 4,213,780, Cl. 75-58.000.

Lavengood, Richard E., to Monsanto Company. Method for preparing a monoalkenyl aromatic polyblend having a dispersed rubber phase as particles with a bimodal particle size distribution. 4,214,056, Cl. 525-71.000.

Lavoie, Edward: *See*—
von Hardenberg, Paul W.; Mard, Kenneth C.; and Lavoie, Edward, 4,213,518, Cl. 188-1.00B.
Layne, Richard C. Dock seal for building doorway. 4,213,279, Cl. 52-173.0DS.
Leblanc, Michele, to Societe d'Optique Precision Electronique et Mecanique Sopelem. Fire control device. 4,213,700, Cl. 356-73.000.
Ledis, Stephen L.: *See*—
Crews, Harold R.; Chastain, Dave, Jr.; and Ledis, Stephen L., 4,213,876, Cl. 252-408.000.
Lee, James G. C.: *See*—
Dickson, Vernon E.; Lee, James G. C.; and Saini, Gurbachan S., 4,214,207, Cl. 455-95.000.
Lee, Thomas B.: *See*—
Bantick, John R.; Hardern, David N.; and Lee, Thomas B., 4,213,903, Cl. 548-250.000.
Lee, Yu-Sun, to B. F. Goodrich Company, The. Pressure-sensitive adhesive. 4,214,061, Cl. 525-455.000.
Leeds & Northrup Company: *See*—
Morse, Richard H., 4,213,304, Cl. 60-664.000.
Leenders, Peter, to Henkel Inc. Amino-ether amphoteric surface-active compounds. 4,214,102, Cl. 562-564.000.
Lefevre, Joseph D., to Dow Chemical Company, The. Electrolytic oxidation in a cell having a separator support. 4,213,833, Cl. 204-98.000.
Lefort, Marcel: *See*—
Bargain, Michel; and Lefort, Marcel, 4,213,914, Cl. 556-419.000.
Lefranc, Guy: *See*—
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.
Legendre, Michel: *See*—
Engelhard, Philippe; Legendre, Michel; Paris, Guy; and Szabo, Georges, 4,213,849, Cl. 208-139.000.
Leidinger, Gustav: *See*—
Horrer, Erwin; and Leidinger, Gustav, 4,213,507, Cl. 172-784.000.
Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Web guiding device. 4,213,553, Cl. 226-196.000.
Leister, Heinrich: *See*—
Muders, Rolf; Leister, Heinrich; Dittmer, Helmut; and Schonhagen, Hubert, 4,213,910, Cl. 260-371.000.
Leisure Products Corporation: *See*—
Church, Peter K., 4,213,873, Cl. 252-174.210.
Leitold, Matyas: *See*—
Schmidt, Gunther; and Leitold, Matyas, 4,213,984, Cl. 424-250.000.
Schmidt, Gunther; and Leitold, Matyas, 4,213,985, Cl. 424-250.000.
Lemke, Verne O.: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., 4,213,332, Cl. 73-134.000.
Lemker, Richard S.; and Storey, Clyde H., to Corning Glass Works. Process for producing a gradient photochromic ophthalmic lens. 4,213,772, Cl. 65-30.00R.
Lemons, Kyle E.; Blish, Richard C., II; and Reimer, Jan D., to Signetics Corporation. Selective plasma vapor etching process. 4,213,818, Cl. 156-643.000.
Lenfant, Pierre: *See*—
Chevet, Robert; and Lenfant, Pierre, 4,214,044, Cl. 429-27.000.
Leonard, Louis H., to Carrier Corporation. Power generation-refrigeration system. 4,214,170, Cl. 290-1.00R.
LeRoy Enterprises, Inc.: *See*—
Ellis, James R., 4,213,417, Cl. 118-30.000.
Leupold, Herbert A.: *See*—
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,213,802, Cl. 148-101.000.
Lever Brothers Company: *See*—
Ainger, George E.; and Caverly, Brian L., 4,214,012, Cl. 426-607.000.
Lever Manufacturing Co.: *See*—
Bogert, Clayton; Alexander, John D.; and Krautheim, Leonard, 4,213,359, Cl. 82-47.000.
Levine, Donald J., to Plough, Inc. Stable sprayable hydrocortisone product. 4,213,979, Cl. 424-243.000.
Levy, Dudley D. Device for vaporizing liquid hydrocarbon fuel. 4,213,432, Cl. 123-549.000.
Lewin, Helmut: *See*—
Schoettle, Klaus; Dobler, Peter; Lewin, Helmut; and Koester, Eberhard, 4,213,222, Cl. 15-100.000.
Lewis, Bernard R. Key actuated security entry system. 4,213,315, Cl. 70-94.000.
Lewis, Jay L., to Robertshaw Controls Company. Intermittent patient suction system and control means therefor. 4,213,457, Cl. 128-276.000.
Lewis, Thomas R.; and Michne, William F., to Sterling Drug Inc. 11-[3-Oxo-ω-(2- and 3-furyl)-lower-alkyl]hexahydro-2,6-methano-3-benzazocines. 4,214,085, Cl. 546-97.000.
Leybold-Heraeus GmbH: *See*—
Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,214,159, Cl. 250-288.000.
Stephan, Herbert, 4,214,015, Cl. 427-42.000.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Schairer, Werner, 4,214,251, Cl. 357-17.000.
Liebert, Oskar; and Worner, Michael, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N). Remote-control adjustment retrofit system for an ink supply in a printing machine. 4,213,390, Cl. 101-365.000.
Lieske, Edgar: *See*—
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,213,758, Cl. 8-409.000.
Lighthipe, Charles H., Jr., to Morse Manufacturing Company, Inc. Drum handling apparatus. 4,213,727, Cl. 414-420.000.
Liljergren, Torsten: *See*—
Gunners, Nils-Erik; Hellgren, Rune V.; and Liljergren, Torsten, 4,213,393, Cl. 102-49.300.
Lin, An-Chung R., to Burroughs Corporation. Ball point pen, ink and its eradicator system. 4,213,717, Cl. 401-18.000.
Lindemann Maschinenfabrik GmbH: *See*—
Dahlem, Peter, 4,213,385, Cl. 100-95.000.
Lingenfelser, Daniel J., to Caterpillar Tractor Co. Bracket assembly for mounting fire extinguishers thereon. 4,213,592, Cl. 248-313.000.
Liniger, Richard B., II: *See*—
Friend, Donald L.; Grosko, John A.; and Liniger, Richard B., II, 4,213,829, Cl. 202-263.000.
Lion Fat & Oil Co., Ltd., The: *See*—
Hayashi, Akira; Ohkouchi, Haruo; Kitano, Kyozo; and Ogoshi, Toshiaki, 4,213,918, Cl. 260-513.00T.
Mandai, Hiroshi; Tominaga, Anri; Yoshimura, Yoshikazu; and Isa, Hiroshi, 4,214,112, Cl. 585-532.000.
Lippler, Remy R.: *See*—
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,214,073, Cl. 528-369.000.
Lipsky, Stephen E., to General Instrument Corporation. Method and apparatus for synchronously tuning the multi-channel superheterodyne receiver of a DF system. 4,214,316, Cl. 455-141.000.
Lis, Per-Arne; and Olausson, Karl A., to Gotaverken Anteknik AB. Water-cooled grate. 4,213,405, Cl. 110-234.000.
List, Hans: *See*—
Feichtinger, Gerhard; Skatsche, Othmar; and List, Hans, 4,213,439, Cl. 123-195.00S.
Litton Systems, Inc.: *See*—
Sanders, Virgil E., 4,213,705, Cl. 356-350.000.
Liu, Wen-Chih; Brown, William E.; and Astle, Gail L., to E. R. Squibb & Sons, Inc. Method for isolating polyether antibiotics. 4,213,966, Cl. 424-123.000.
Lively, Steven A.; and Gwin, Richard B., to H. C. Price Co. Cutting device for pipe jackets. 4,213,357, Cl. 82-4.00C.
Liversain, Andre: *See*—
Garrett, Roger; and Liversain, Andre, 4,213,562, Cl. 236-46.00R.
Lodge-Cottrell, Ltd.: *See*—
Wyatt, John G., 4,213,766, Cl. 55-2.000.
Lodrick, Robert. Foam generating and spraying apparatus. 4,213,936, Cl. 422-133.000.
Loeffler, Hans-Peter; Adolphi, Heinrich; and Kiehs, Karl, to BASF Aktiengesellschaft. Haloalkyldithiophosphoric acid esters. 4,213,976, Cl. 424-224.000.
Loehr, Wilhelm: *See*—
Kaessner, Hugo; and Loehr, Wilhelm, 4,213,713, Cl. 366-279.000.
Loeser, Werner: *See*—
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.
Logan, Robert J., to Inductive Controls Limited. Motor control circuits. 4,214,195, Cl. 318-745.000.
Lojek, John S.: *See*—
Giilck, Lawrence J.; and Lojek, John S., 4,213,776, Cl. 71-117.000.
Long, R. H.: *See*—
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,213,862, Cl. 210-83.000.
Longhouse, Richard E., to General Motors Corporation. Shrouding for engine mounted cooling fan. 4,213,426, Cl. 123-41.490.
Lopez-Martinez, Luis J. A. Process for the binding of books, magazines and the like. 4,213,220, Cl. 11-1.00R.
Loran, Thomas J. Cleaning and lubricating compositions and method of using the same. 4,213,870, Cl. 252-51.50R.
L'Oreal: *See*—
Grollier, Jean-Francois; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; and Cauwet, Daniele, 4,213,960, Cl. 424-47.000.
Gueret, Jean-Louis H.; and Adams, Nancy, 4,213,472, Cl. 132-88.700.
Louisot, Pierre: *See*—
Dirheimer, Guy; and Louisot, Pierre, 4,213,970, Cl. 424-180.000.
Lovelace, David F.: *See*—
Thompson, George H. B.; and Lovelace, David F., 4,213,808, Cl. 148-188.000.
Lovell, James B., to American Cyanamid Company. Insecticidal 1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one (1,4,5,6-tetrahydro-2-pyrimidinyl)hydrazones. 4,213,988, Cl. 424-251.000.
Lovell, Walter C.: *See*—
Kelley, John S.; Grise, Frederick G. J.; and Lovell, Walter C., 4,213,324, Cl. 72-405.000.
Lowe, Jack M.: *See*—
Ottewell, Roger J.; and Lowe, Jack M., 4,213,485, Cl. 138-130.000.
Lowenstein, Carl D.: *See*—
Spiess, Frederick N.; Boegeman, Dwight E.; Pavlicek, Frank V.; and Lowenstein, Carl D., 4,214,314, Cl. 367-2.000.
Lowther, Frank E., to Union Carbide Corporation. Corona reaction system. 4,213,838, Cl. 204-176.000.
Luallin, Edwin D., to Exxon Research & Engineering Co. Autorefrigerated polymerization process. 4,214,063, Cl. 526-68.000.
Lucas Industries Limited: *See*—
Read, Martin A., 4,213,425, Cl. 123-478.000.

Lucas, John M., to Domtar Inc. Graininess sensor. 4,213,708, Cl. 356-429.000.

Lucek, John R.; and McCall, David L., to General Electric Company. Vapor shield support ring for a vacuum interrupter. 4,214,138, Cl. 200-144.00B.

Luke, John A.: *See*—
Horsewell, Henry G.; Green, John D.; Luke, John A.; and Harrison, Raymond J., 4,213,470, Cl. 131-261.00B.

Lumby, Dale, to TRW Inc. Strut rod mounting assembly. 4,213,718, Cl. 403-197.000.

Lummus Company, The: *See*—
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,213,862, Cl. 210-83.000.
Fanelli, Anthony J.; and Gelbein, Abraham P., 4,214,087, Cl. 546-319.000.

Lumoprint Zindler KG (GmbH & Co.): *See*—
Salger, Werner, 4,213,617, Cl. 277-12.000.

Lundh, Folke: *See*—
Boberg, Anders; Larsson, Bernt; and Lundh, Folke, 4,213,885, Cl. 260-29.6TA.

M. P. H. Industries, Inc.: *See*—
Patterson, Robert E., 4,214,243, Cl. 343-8.000.

M & W Gear Company: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., 4,213,332, Cl. 73-134.000.

Maag Gear-Wheel & Machine Company Limited: *See*—
Fivian, Daniel A., 4,213,277, Cl. 51-325.000.

Maag, Oskar, to Maag Zahnrader & Maschinen Aktiengesellschaft. Support arrangement for a workpiece table of a gear testing machine. 4,213,401, Cl. 108-20.000.

Maag Zahnrader & Maschinen Aktiengesellschaft: *See*—
Maag, Oskar, 4,213,401, Cl. 108-20.000.

Mabuchi, Hiroshi; and Yabe, Isao, to Citizen Watch Co., Ltd. Receiving unit for timepieces. 4,213,293, Cl. 368-152.000.

Mach, Dennis E.: *See*—
Knight, George W.; and Mach, Dennis E., 4,213,880, Cl. 252-431.00R.

Machines Chambon: *See*—
Corse, Louis G., 4,213,249, Cl. 34-12.000.

Madec, Marcel; Espitalie, Jean; Laporte, Jean-Loup; and Barsony, Imre, to Institut Francais du Petrole. Method and device for analyzing geological sediments and for determining their organic sulfur content. 4,213,763, Cl. 23-230.0EP.

Magerkurth, Bernhard: *See*—
Hahn, Erwin; Magerkurth, Bernhard; Lach, Dietrich; and Wuertele, Lothar, 4,213,760, Cl. 8-94.170.

Magett, Fred M. Rotatable lamp fixture. 4,214,296, Cl. 362-35.000.

Magnuson, Lars. Spool making machine. 4,213,576, Cl. 242-67.30R.

Magyar Asvanyolaj es Foldgaz Kiserleti Intezet: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Mahler, Walter; and Forshey, William O., Jr., to Du Pont de Nemours, E. I., and Company. Process of preparing particulate poly(alumino-silicate). 4,213,949, Cl. 423-329.000.

Mahler, Walter, to Du Pont de Nemours, E. I., and Company. Process for preparing amorphous particulate poly(alumino-silicate). 4,213,950, Cl. 423-329.000.

Maier, Elmar; and Heeb, Othmar, to Hilti Aktiengesellschaft. Compressed air apparatus for driving fastening elements. 4,213,301, Cl. 60-407.000.

Maier, Ludwig, to Ciba-Geigy Corporation. Process for producing phosphonic acid halides. 4,213,922, Cl. 260-958.000.

Maier, William B., II: *See*—
Freund, Samuel M.; Maier, William B., II; Beattie, Willard H.; and Holland, Redus F., 4,213,836, Cl. 204-157.10R.

Majoor, Hendrik, to Hoogovens Ijmuiden, B.V. Expandable coiler mandrel. 4,213,577, Cl. 242-72.00R.

Makimoto, Mitsuo: *See*—
Saito, Mitsuo; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,214,218, Cl. 334-45.000.

Makino, Takao: *See*—
Hotta, Toshihiro; and Makino, Takao, 4,214,169, Cl. 250-505.000.

Makovec, Donald J.; and Hutson, Thomas, Jr., to Phillips Petroleum Company. Alkylation process utilizing plural olefinic reactants. 4,214,115, Cl. 585-716.000.

Malkani, Dalip T.: *See*—
Middlemiss, Andrew; and Malkani, Dalip T., 4,213,231, Cl. 29-18.000.

Maloney, John V.: *See*—
Scrivo, Jerry V.; and Maloney, John V., 4,213,644, Cl. 293-117.000.

Mamuzic, Rastko: *See*—
Garman, John A.; and Mamuzic, Rastko, 4,214,103, Cl. 568-639.000.

Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, to Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.). Process for manufacturing plastic articles having on the surface thereof a protected metal film. 4,214,016, Cl. 427-54.100.

Mancini, Derek V., to Consumers Glass Company Limited. Cartoning apparatus. 4,213,285, Cl. 53-137.000.

Mandai, Hiroshi; Tominaga, Anri; Yoshimura, Yoshikazu; and Isa, Hiroshi, to Lion Fat & Oil Co., Ltd., The. Process for preparing olefin oligomer. 4,214,112, Cl. 585-532.000.

Mandrin, Charles, to Sulzer Brothers Limited. Process for the preparation of ammonia and heavy water. 4,213,953, Cl. 423-359.000.

Maney, Thomas P. Adjustable paper cap. 4,213,206, Cl. 2-197.000.

Mangan, William E.: *See*—
Casciani, Ralph A.; Wilbern, Wilmer L.; Mangan, William E.; and Franson, Paul D., 4,213,955, Cl. 423-442.000.

Mann, Egon: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,213,514, Cl. 180-308.000.

Mann, Friedrich H.; and Sensabaugh, Paul F., to General Electric Company. Battery charger for a portable radio. 4,214,197, Cl. 320-2.000.

Mann, William W.: *See*—
Deardorff, Duane R.; and Mann, William W., 4,213,571, Cl. 241-48.000.

Mannesmann Aktiengesellschaft: *See*—
Grebe, Klaus; and De Haas, Hans, 4,213,777, Cl. 75-0.5BA.

Mannesmannufer Aktiengesellschaft: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, 4,213,552, Cl. 226-170.000.

Manowitz, Milton: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,214,002, Cl. 424-300.000.

Manz, David F.: *See*—
Irwin, Clarence C.; Manz, David F.; and Auman, John T., 4,213,652, Cl. 297-478.000.

Marchak, Roman O.: *See*—
Peterson, William A., Jr.; and Marchak, Roman O., 4,214,307, Cl. 364-431.000.

Marchioro, Ignazio: *See*—
Biondetti, Mario; and Marchioro, Ignazio, 4,213,232, Cl. 29-116.0AD.

Marconi Company Limited, The: *See*—
Langdon, Roger M., 4,213,337, Cl. 73-290.00V.

Mard, Kenneth C.: *See*—
von Hardenberg, Paul W.; Mard, Kenneth C.; and Lavoie, Edward, 4,213,518, Cl. 188-1.00B.

Mares, Frank; and Jacobson, Stephen E., to Allied Chemical Corporation. Hydrogen peroxide oxidation process for ketones. 4,213,906, Cl. 260-343.000.

Marhofer, Edwin G.: *See*—
Gehrig, Neil E.; and Marhofer, Edwin G., 4,213,809, Cl. 149-60.000.

Marianeschi, Edmondo; and Marini, Paolo, to Centro Sperimentale Metallurgico S.p.A.; and Terni-Societe per l'Industria e l'Elettricita S.p.A. Coating solution for applying tensioning coatings to electrical steel strip. 4,213,792, Cl. 106-286.600.

Marine Construction & Design Co.: *See*—
Anderson, Joseph W., 4,213,863, Cl. 210-108.000.

Marini, Paolo: *See*—
Marianeschi, Edmondo; and Marini, Paolo, 4,213,792, Cl. 106-286.600.

Marmol, Ronald A., to United Technologies Corporation. Bearing support structure combining fluid damping and spring damping apparatus. 4,213,661, Cl. 308-184.00R.

Marne, Sheldon. Metatarso-phalangeal joint implant. 4,213,208, Cl. 3-1.910.

Marsh, David R.: *See*—
Sullivan, John B.; and Marsh, David R., 4,213,252, Cl. 35-10.240.

Marshall Equipment Co. Inc.: *See*—
Cromley, Harold D., 4,213,379, Cl. 98-33.00R.

Martin, Edward S., to Aluminum Company of America. Production of aluminum chloride from clay using staged reactors. 4,213,943, Cl. 423-135.000.

Martin, Jerry R., to Abbott Laboratories. 4-N, 2'-N and 4,2'Di-N-fortimicins AH and AI. 4,213,972, Cl. 424-181.000.

Martin, Jerry R., to Abbott Laboratories. 4-N,2'-N and 4,2'-Di-N-fortimicin AO derivatives. 4,213,974, Cl. 424-180.000.

Martin, Jerry R., to Abbott Laboratories. 4-N, 2'-N and 4,2'-Di-N-fortimicin AL derivatives. 4,214,079, Cl. 536-17.00R.

Martin, Jerry R.: *See*—
Tadanier, John S.; and Martin, Jerry R., 4,214,075, Cl. 536-17.00R.

Martin, John K.: *See*—
Cattorini, Joseph F.; Park, Thomas R.; and Martin, John K., 4,213,601, Cl. 270-61.00F.

Martin Marietta Corporation: *See*—
McKay, Michael W.; and McDirmit, Evan L., 4,214,244, Cl. 343-18.00E.

Martin, Walter H.: *See*—
Bryan, Henry A.; Martin, Walter H.; and Konves, Richard L., 4,213,423, Cl. 119-86.000.

Martino, Peter V. Apparatus for processing a particulating printing plate. 4,213,420, Cl. 118-713.000.

Martins, Joseph G.: *See*—
Donermeyer, Donald D.; and Martins, Joseph G., 4,214,019, Cl. 427-142.000.

Marvin Glass & Associates: *See*—
Erickson, Erick E.; Wildman, John R.; and Meyer, Burton C., 4,213,268, Cl. 46-202.000.
Wildman, John R.; and Meyer, Burton C., 4,213,612, Cl. 273-355.000.

Mas, Henri; and Lacroix, Paul. Snow shoe. 4,213,256, Cl. 36-124.000.

Masada, Gary M., to Chevron Research Company. Lube oil blend process and composition. 4,213,845, Cl. 208-19.000.

Masalov, Gennady F.: *See*—
Polovnikov, Sergei V.; Zaznobin, Anatoly M.; Masalov, Gennady F.; and Mischenkov, Alexandr A., 4,213,346, Cl. 73-660.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Hagen, Hans, 4,213,625, Cl. 280-43.230.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N): *See—*
Liebert, Oskar; and Worner, Michael, 4,213,390, Cl. 101-365.000.
Mason, Martin K., to Hewlett-Packard Company. Digital servo anti-hunt circuit. 4,214,193, Cl. 318-611.000.
Massey, Richard C. Cap for the nozzle of a caulking cartridge. 4,213,546, Cl. 222-546.000.
Massiah, Thomas F.: *See—*
Attwell, Michael C.; Massiah, Thomas F.; Vergottini, Roberto A.; and Ziegler, Peter, 4,213,911, Cl. 260-397.100.
Masuda, Takao: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 4,213,784, Cl. 430-616.000.
Masuda, Toyohiko: *See—*
Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toyohiko, 4,213,946, Cl. 423-242.000.
Masumi, Jiro: *See—*
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,214,016, Cl. 427-54.100.
Matsui, Kenji: *See—*
Kawaharazaki, Takashi; Teraoka, Fuminori; Kubota, Tatsushi; and Matsui, Kenji, 4,213,580, Cl. 242-107.000.
Matsui, Kiyohide: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,214,097, Cl. 560-213.000.
Matsui, Ryoji: *See—*
Fujii, Setsuro; Sakurai, Yojiro; Nakayama, Toyoo; and Matsui, Ryoji, 4,214,093, Cl. 560-34.000.
Matsuki, Yutaka: *See—*
Watanabe, Seizaburo; and Matsuki, Yutaka, 4,214,054, Cl. 521-95.000.
Matsushita Electric Corporation: *See—*
Rzeszewski, Theodore S.; and Frantzis, Paul D., 4,214,274, Cl. 358-193.100.
Matsushita Electric Industrial Co., Ltd.: *See—*
Saito, Mitsuo; and Yamashita, Sadahiko, 4,214,217, Cl. 334-45.000.
Saito, Mitsuo; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,214,218, Cl. 334-45.000.
Matsushita, Shigeo: *See—*
Sugimoto, Shigetoki; Ishikawa, Ro; and Matsushita, Shigeo, 4,213,677, Cl. 350-96.180.
Matsuura, Tsuguo: *See—*
Shimizu, Tsuguo; and Matsuura, Tsuguo, 4,214,304, Cl. 364-200.000.
Matte, Roger A. Motorcycle railway attachment. 4,213,397, Cl. 105-95.000.
Matthews, James D.: *See—*
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.
Matthies, Paul: *See—*
Eckell, Albrecht; Matthies, Paul; Pilz, Georg; and Rotzoll, Rudi-Heinz, 4,213,884, Cl. 260-29.20N.
Maul, Rudolf: *See—*
Abeler, Gerd; and Maul, Rudolf, 4,214,088, Cl. 546-321.000.
Mauron, Gerard, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Passive safety belt for an automobile vehicle. 4,213,637, Cl. 280-802.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Hoppe, Walter; and Typke, Dieter, 4,214,162, Cl. 250-311.000.
Maximov, Ivan V.: *See—*
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,213,834, Cl. 204-129.250.
Maximovich, Boleslav I.: *See—*
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.
Mayo, Carlos, to C. Mayo, Inc. Fireplace combustion air duct apparatus. 4,213,445, Cl. 126-143.000.
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., to Swiss Aluminium Ltd. Electrical conductivity of aluminum alloys through the addition of yttrium. 4,213,800, Cl. 148-2.000.
Mays, Robert K.: *See—*
Williams, Lloyd E.; and Mays, Robert K., 4,213,874, Cl. 252-174.250.
Mazziotti, Philip J., to Dana Corporation. Power shaft support bearing. 4,213,512, Cl. 180-233.000.
McAlpine, James B., to Abbott Laboratories. 4N, 2'-N and 4,2'-Di-N-fortimicin AK derivatives. 4,213,971, Cl. 424-181.000.
McAlpine, James B., to Abbott Laboratories. 2'-N-Substituted fortimicin B and derivatives. 4,214,076, Cl. 536-17.00R.
McAuliffe, Gerald N.: *See—*
Cavil, David T.; and McAuliffe, Gerald N., 4,214,288, Cl. 361-6.000.
McCabe, Francis J. Telescoping heat responsive releasing means. 4,213,227, Cl. 16-48.500.
McCabe, Francis J. Press. 4,213,365, Cl. 83-530.000.
McCall, David L.: *See—*
Lucek, John R.; and McCall, David L., 4,214,138, Cl. 200-144.00B.
McCaney, Carlos P.; and Bocksruker, Ronald W. Can crusher. 4,213,387, Cl. 100-245.000.
McCarty, Charles B.; and Seiden, Paul, to Procter & Gamble Company, The. Fabric treatment compositions containing polyglycerol esters. 4,214,038, Cl. 428-411.000.
McCaulay, David A.; and Nevitt, Thomas D., to Standard Oil Co. (Indiana). Hydrocarbon isomerization utilizing a hydrocarbon promoter with tantalum pentafluoride and hydrogen halide catalyst. 4,214,116, Cl. 585-747.000.
McClenan, Warren G. Visually inspectable grounding connector for electrical cable. 4,213,664, Cl. 339-14.00R.
McCord Corporation: *See—*
Scrivo, Jerry V.; and Maloney, John V., 4,213,644, Cl. 293-117.000.
McDirmit, Evan L.: *See—*
McKay, Michael W.; and McDirmit, Evan L., 4,214,244, Cl. 343-18.00E.
McGill Manufacturing Company, Inc.: *See—*
Beck, Frederick R., 4,213,513, Cl. 180-272.000.
McHugh, John V.: *See—*
Jutte, Gottfried W.; and McHugh, John V., 4,214,045, Cl. 429-87.000.
McIntire, Ronald A., to Fike Metal Products Corporation. Discharge nozzle for fluorinated hydrocarbon fire suppression system. 4,213,567, Cl. 239-396.000.
McKay, Michael W.; and McDirmit, Evan L., to Martin Marietta Corporation. Null pattern technique for reduction of an undesirable interfering signal. 4,214,244, Cl. 343-18.00E.
McKenzie, Geoffrey F. Container lifter. 4,213,728, Cl. 414-446.000.
McManus, Stephen J.: *See—*
Sterling, Henley F.; Bush, Eric L.; and McManus, Stephen J., 4,214,293, Cl. 361-433.000.
McNeil Corporation: *See—*
Shannon, Joseph W., 4,213,339, Cl. 73-304.00R.
McNeilab, Inc.: *See—*
Carson, John R., 4,213,905, Cl. 260-326.470.
McPeak, Walter G. Neckbone and shoulder protective apparel for barbell lifters. 4,213,605, Cl. 272-119.000.
Mead Corporation, The: *See—*
Calvert, Rodney K.; Scott, Dale K.; and Fishback, Alton J., 4,213,283, Cl. 53-48.000.
Gudorf, James L., 4,213,238, Cl. 29-878.000.
Mead, Judson: *See—*
Adams, William M.; Blakely, Robert F.; Ellis, Charles R.; and Mead, Judson, 4,214,238, Cl. 340-690.000.
Mechanical Seal & Service, Inc.: *See—*
Thurber, Mickey D., 4,213,618, Cl. 277-93.00R.
Mechanical Technology Incorporated: *See—*
Gray, Stanley, 4,213,657, Cl. 308-9.000.
MedaSonics, Inc.: *See—*
Reinertson, John E.; and Wells, John L., 4,213,348, Cl. 73-765.000.
Mefcor, Inc.: *See—*
Hurt, Frank K.; and Wellons, Edwin L., 4,213,743, Cl. 417-229.000.
Mehren, Herbert; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Traffic system with drive channel and road vehicles mechanically cross guided-therein. 4,213,396, Cl. 104-130.000.
Meier, Ludwig: *See—*
Kuhn, Gebhard; and Meier, Ludwig, 4,214,297, Cl. 362-327.000.
Meiller, Francois: *See—*
Blanc, Jean-Pierre; and Meiller, Francois, 4,213,785, Cl. 106-38.350.
Meiller Research, Inc.: *See—*
Isbell, Arthur F., 4,213,875, Cl. 252-188.30R.
Meissner, Konrad E., to California Processing Machinery. Selective pitter for fruits of the drupe type. 4,213,382, Cl. 99-486.000.
Melander, Clarence, to East Wind Industries, Inc. Tensioning device for an inflatable structure. 4,213,219, Cl. 9-4.00R.
Mellen, Arthur J.; and Reitlinger, Adolf, to Contact Communication Corporation. Low noise-high gain JFET amplifier for a piezoelectric transducer. 4,214,215, Cl. 330-277.000.
Memmi, Massimo: *See—*
Azzerri, Nazzareno; Bruno, Roberto; and Memmi, Massimo, 4,213,839, Cl. 204-181.00R.
Merger, Franz: *See—*
Adolphi, Heinrich; Baumann, Annegrit; Huber, Rolf; Kiehs, Karl; and Merger, Franz, 4,213,992, Cl. 424-273.00P.
Merkel, Karl: *See—*
Datow, Joachim; Decker, Martin; Merkel, Karl; and Neumayr, Franz, 4,213,919, Cl. 260-544.00K.
Merriman, George W. Connecting cable. 4,214,214, Cl. 330-65.000.
Mersmann, Harry J.: *See—*
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,998, Cl. 424-285.000.
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,999, Cl. 424-285.000.
Mesens, Jean; and Haagen, Victor, to Janssen Pharmaceutica N.V. Fluspirilene-containing compositions. 4,213,963, Cl. 424-80.000.
Messer Griesheim GmbH: *See—*
Pfeiffer, Ferdinand; and Rottwinkel, Leo, 4,213,501, Cl. 169-46.000.
Metallhuttenwerke Lubeck GmbH: *See—*
Sitz, Claus, 4,213,778, Cl. 75-25.000.
Metz Mannheim GmbH: *See—*
Metz, Walter, 4,213,347, Cl. 73-716.000.
Metz, Walter, to Metz Mannheim GmbH. Indicating device for measuring and control apparatus. 4,213,347, Cl. 73-716.000.
Meyer, Burton C.: *See—*
Erickson, Erick E.; Wildman, John R.; and Meyer, Burton C., 4,213,268, Cl. 46-202.000.
Wildman, John R.; and Meyer, Burton C., 4,213,612, Cl. 273-355.000.

Meyer, Fritz, to Siemens Aktiengesellschaft. Digital to analog converter using multiple emitter transistors. 4,214,235, Cl. 340-347.0DA.

Meyer, Jacques; and Bernelin, Daniel, to Rhone-Poulenc Industries. Cross-linkable, saturated polyester coating compositions. 4,214,040, Cl. 428-458.000.

Meyers, George L., to American Can Company. Divided display carton. 4,213,559, Cl. 229-16.00D.

Michne, William F.: *See*—
Lewis, Thomas R.; and Michne, William F., 4,214,085, Cl. 546-97.000.

Microlife Technics, Inc.: *See*—
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,214,008, Cl. 426-53.000.

Middlemiss, Andrew; and Malkani, Dalip T., to British Steel Corporation. Manufacture of metal strip. 4,213,231, Cl. 29-18.000.

Mihalic, William T., to Eaton Corporation. Valve selector for shaft-mounted rockers. 4,213,442, Cl. 123-198.00F.

Mikajiri, Kazukichi, to Canon Kabushiki Kaisha. Automatic exposure time control apparatus for camera. 4,213,688, Cl. 354-23.00D.

Miles, Alfred. Coupling for interconnecting conduits. 4,213,640, Cl. 285-137.00R.

Miles Laboratories, Inc.: *See*—
Buckler, Robert T., 4,213,894, Cl. 260-112.50R.
Buckler, Robert T., 4,213,964, Cl. 424-85.000.
Carrico, Robert J.; and Johnson, Richard D., 4,213,893, Cl. 260-112.50R.

Milgram, Jerome H., to Offshore Devices, Inc. Self-reversing hydraulic control system and self-reversing pump incorporating such system. 4,213,298, Cl. 60-369.000.

Miller, Charles H.: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,214,028, Cl. 428-159.000.

Miller, Eldon D., to Lava Crucible Refractories Co. Method of introducing calcium and calcium alloys into a vessel of molten metal. 4,213,780, Cl. 75-58.000.

Miller, Jonathan, to Shop-Vac Corporation. By-pass type portable vacuum cleaner. 4,213,224, Cl. 15-344.000.

Miller, Michael B.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.

Mills, King L.: *See*—
Hunt, Harold R.; and Mills, King L., 4,213,957, Cl. 423-450.000.

Miltenberger, Louis E., to Hercules Incorporated. Nested cone extendible nozzle system for a rocket motor. 4,213,566, Cl. 239-265.430.

Milton, A. Fenner; and Giallorenzi, Thomas G., to United States of America, Navy. Planar fiber optic star and access coupler. 4,213,670, Cl. 350-96.160.

Minami, Hidehiro; and Aoki, Teruo, to Nissan Motor Company, Limited. Spark-ignition internal combustion engine capable of reducing noxious constituents in exhaust gases. 4,213,430, Cl. 123-440.000.

Minami, Setsuo: *See*—
Sugiura, Muneharu; Minami, Setsuo; and Miyamoto, Koichi, 4,213,690, Cl. 355-8.000.

Minkiewicz, Andre E.; and Poirier, Norbert, to Compagnie Francaise des Petroles. Method and apparatus for automatic welding of bevelled tubes. 4,213,555, Cl. 228-29.000.

Minkin, Gary E. Power parts washer. 4,213,475, Cl. 134-111.000.

Mino, Masao; and Ohno, Takeshi, to Kabushiki Kaisha Mino Seisakusho. Grooved traverse drum used in drum winder. 4,213,574, Cl. 242-43.200.

Minolta Camera Kabushiki Kaisha: *See*—
Yamada, Seiji, 4,213,682, Cl. 354-23.00D.

Mischenkov, Alexandr A.: *See*—
Polovnikov, Sergei V.; Zaznobin, Anatoly M.; Masalov, Gennady F.; and Mischenkov, Alexandr A., 4,213,346, Cl. 73-660.000.

Mita Industrial Company Limited: *See*—
Miyakawa, Nobuhiro; Inoue, Eiichi; and Kokado, Hiroshi, 4,214,031, Cl. 428-213.000.

Mitani, Akira; and Sanguu, Isao, to Nippon Electric Co., Ltd. Reel drive motor control system for cassette/cartridge tape recorders. 4,213,583, Cl. 242-186.000.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Olefin hydroformylation. 4,213,921, Cl. 568-455.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Okushima, Hiromi; Nitta, Issei; and Furuya, Rikizo, 4,213,902, Cl. 260-239.570.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawanami, Takao; Tajiri, Hiromi; and Uomori, Akiyoshi, 4,214,143, Cl. 219-97.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Komatsu, Makoto; Ohta, Tazuo; Tanaka, Toru; and Akagi, Kimiko, 4,214,100, Cl. 562-416.000.

Mitsui, Hajime: *See*—
Hayata, Toshinori; Tsuji, Kunio; and Mitsui, Hajime, 4,213,681, Cl. 354-21.000.

Miura, Koryo. Method of and apparatus for measuring stiffness. 4,213,349, Cl. 73-847.000.

Miura, Yoshiharu; Aoyagi, Sadayoshi; and Miyamoto, Kazuhisa, to Miura, Yoshiharu; and Doi, Hideo. Artificial medical material with anticoagulative activity. 4,213,962, Cl. 424-78.000.

Miya, Bunji; and Kimura, Akio, to Kao Soap Co., Ltd. Process for preparing ether carboxylates. 4,214,101, Cl. 562-421.000.

Miyakawa, Nobuhiro; Inoue, Eiichi; and Kokado, Hiroshi, to Mita Industrial Company Limited. Conductive substrate for electrosensitive recording material. 4,214,031, Cl. 428-213.000.

Miyamoto, Kazuhisa: *See*—
Miura, Yoshiharu; Aoyagi, Sadayoshi; and Miyamoto, Kazuhisa, 4,213,962, Cl. 424-78.000.

Miyamoto, Koichi: *See*—
Sugiura, Muneharu; Minami, Setsuo; and Miyamoto, Koichi, 4,213,690, Cl. 355-8.000.

Miyashita, Toshio; Fujii, Yoshizo; and Sawabe, Takeshi, to Shinko Automatic Device Co., Ltd. Automatic vending machine with lottery bonus. 4,213,524, Cl. 194-2.000.

Mizukami, Mineo, to Nippon Electric Co., Ltd. Digital apparatus for correcting a time-base error in a television video signal. 4,214,262, Cl. 358-19.000.

Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Morgan, Norman J., 4,214,107, Cl. 568-897.000.
Chen, Nai Y.; and Wang, Ikai, 4,213,847, Cl. 208-111.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,213,921, Cl. 568-455.000.
Steiner, Robert H.; Duncan, Gary L.; and Touhsaent, Robert E., 4,214,039, Cl. 428-414.000.

Modersohn, Charles W., to Warner Electric Brake & Clutch Company. Clutch-brake assembly for rotary implements. 4,213,521, Cl. 192-18.00R.

Moll, Hans: *See*—
Haese, Egon; Moll, Hans; and Willms, Rolf, 4,213,945, Cl. 423-240.000.

Molson Companies Limited, The: *See*—
Graham, Robert H.; and Campbell, Barry D., 4,213,526, Cl. 198-400.000.

Momiyama, Kikuo, to Canon Kabushiki Kaisha. Tessar form photographic lens. 4,213,674, Cl. 350-227.000.

Monarch Marking Systems, Inc.: *See*—
Jacobson, David N., 4,214,024, Cl. 428-41.000.

Monsanto Company: *See*—
Donermeyer, Donald D.; and Martins, Joseph G., 4,214,019, Cl. 427-142.000.
Lavengood, Richard E., 4,214,056, Cl. 525-71.000.
Ward, Robert R.; Chang, Richard C.; Danos, James C.; and Carden, Joseph A., Jr., 4,214,020, Cl. 427-296.000.

Montgomery, Gary V., to Sunbeam Plastics Corporation. Child-resistant closure. 4,213,534, Cl. 215-216.000.

Moog, Robert A., to Norlin Music, Inc. Monophonic touch sensitive keyboard. 4,213,367, Cl. 84-1.220.

Mooney, Thomas F., III: *See*—
Schweickart, Albert J.; and Mooney, Thomas F., III, 4,213,336, Cl. 73-215.000.

Moore, George B. Steering stabilizer apparatus. 4,213,626, Cl. 280-94.000.

Moore, James A.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.

Moore, James H.: *See*—
Sikdar, Subhas K.; and Moore, James H., 4,213,951, Cl. 423-339.000.

Moore, Malcolm, to s.a. Texaco Belgium n.v. Method of measuring low concentrations of a light absorbing component. 4,213,699, Cl. 356-70.000.

Moore, Robert G. Two-stage vehicle spring suspension. 4,213,633, Cl. 280-716.000.

Morande, James A., Jr., to All Nighter Stove Works, Inc. Stove construction. 4,213,443, Cl. 126-72.000.

Morelli, Frank A.: *See*—
Bauman, Albert J.; and Morelli, Frank A., 4,213,768, Cl. 55-97.000.

Moretto, Hans-Heinrich; Steinberger, Helmut; Larking, Ingrid; and Sattlegger, Hans, to Bayer Aktiengesellschaft. Organopolysiloxanes modified with poly-carbodiimide. 4,214,066, Cl. 528-28.000.

Morgan, Norman J.: *See*—
Chang, Clarence D.; and Morgan, Norman J., 4,214,107, Cl. 568-897.000.

Morgunsky, Evgeny I.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.

Morimoto, Kiyoshi; Watanabe, Hiroshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Ion plating apparatus. 4,213,844, Cl. 204-298.000.

Morito, Hiroshi, to Nippon Electric Co., Ltd. Digital vertical sync signal separator. 4,214,270, Cl. 358-154.000.

Moroe, Mitio: *See*—
Moroe, Tatsuo; Komatsu, Akira; Doi, Kiyosumi; and Moroe, Mitio, 4,214,110, Cl. 585-241.000.

Moroe, Tatsuo; Komatsu, Akira; Doi, Kiyosumi; and Moroe, Mitio, to Takasago Perfumery Co., Ltd. Process for producing hydrocarbons. 4,214,110, Cl. 585-241.000.

Morris, Harold B., to Glasrock Products, Inc. Method for bonding porous coating to rigid structural member. 4,213,816, Cl. 156-245.000.

Morrison, Donald R. Portable vibrating concrete screed. 4,213,749, Cl. 425-456.000.

Morse Manufacturing Company, Inc.: *See*—
Lighthipe, Charles H., Jr., 4,213,727, Cl. 414-420.000.

Morse, Richard H., to Leeds & Northrup Company. Boiler control system. 4,213,304, Cl. 60-664.000.

Morton, Dennis S.: *See—*
Stromsta, Roger R.; Nathanson, Marshall R.; and Morton, Dennis S., 4,214,287, Cl. 360-103.000.

Morton, Harold, to Oldham Batteries Limited. Portable electric lamp adjustable from spot beam to diffused beam. 4,214,295, Cl. 362-164.000.

Morton, T. R.: *See—*
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.

Moser, Gottfried; and Jansen, Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Disc brake, especially for motor vehicles. 4,213,519, Cl. 188-71.400.

Moser, Helmut; and von Tobel, Hans R., to Sandoz Ltd. Disazo and trisazo compounds having a 3-pyridinium or substituted pyridinium-4-methyl-6-hydroxypyridone-2 coupling component radical. 4,213,897, Cl. 260-154.000.

Motonami, Masanao: *See—*
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,213,651, Cl. 297-475.000.

Motorola, Inc.: *See—*
Bafaro, Michael P.; and Parker, James J., 4,214,188, Cl. 315-382.000.
Brenner, Charles H., 4,213,394, Cl. 102-213.000.
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,232, Cl. 340-347.0AD.
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,233, Cl. 340-347.0AD.

Moulinex, Societe Anonyme: *See—*
Amiot, Jacques H. J., 4,213,569, Cl. 241-37.500.

Moulis, Edward J.: *See—*
Jones, William T., Jr.; and Moulis, Edward J., 4,214,120, Cl. 174-52.0FP.

Moulton, Richard J.: *See—*
Goodrich, Richard B.; and Moulton, Richard J., 4,213,930, Cl. 264-135.000.

Mourier, Georges, to Thomson-CSF. Ion source producing a dense flux of low energy ions. 4,214,187, Cl. 315-111.800.

Moutton, Louis: *See—*
Denninger, Claude; and Moutton, Louis, 4,213,265, Cl. 43-84.000.

Mozer, Forrest S.; and Stauduhar, Richard P., to Mozer, Forrest S. Method and apparatus for speech synthesizing. 4,214,125, Cl. 179-1.0SM.

Mozzhukhin, Anatoly A.: *See—*
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.

Muders, Rolf; Leister, Heinrich; Dittmer, Helmut; and Schonhagen, Hubert, to Bayer Aktiengesellschaft. Process for the preparation of 1-amino-4-bromoanthraquinone-2-sulphonic acid I. 4,213,910, Cl. 260-371.000.

Mueller, Curt: *See—*
Entschel, Roland; Mueller, Curt; and Steinemann, Willy, 4,213,898, Cl. 260-156.000.

Mukhina, Tamara N.: *See—*
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.

Muller, Hans; and Sotirianos, Konstantin, to Chemap AG. Pressure filter and process for cleaning it. 4,213,861, Cl. 210-82.000.

Mungons, Edwin M.: *See—*
Cowles, Clarence W.; Breashears, James C.; and Mungons, Edwin M., 4,213,729, Cl. 414-462.000.

Munroe, Ronald G., to Eagle Electric Mfg. Co., Inc. Bottom turn socket. 4,214,135, Cl. 200-51.170.

Murphy, Patrick, to Boeing Company, The. Mounting system for a wing mounted aircraft engine. 4,213,585, Cl. 244-54.000.

Murray, Ronald A.; and Piccirillo, Gary P., to TRW Inc. Electrical connector. 4,213,665, Cl. 339-17.00D.

Murray, William S., Jr.: *See—*
Bitely, Clarence J., Jr.; Dromgold, Luther D.; and Murray, William S., Jr., 4,213,868, Cl. 252-11.000.

Musa, Fuad H.: *See—*
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,232, Cl. 340-347.0AD.
Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., 4,214,233, Cl. 340-347.0AD.

Musil, Josef: *See—*
Gebert, Ulrich; Musil, Josef; and Weber, Rolf-Ortwin, 4,213,986, Cl. 424-250.000.

Mussatt, Thomas J., to Sangamo Weston, Inc. Method and apparatus for controlling tape recorder. 4,214,284, Cl. 360-72.100.

Myers, Charles H. Rear viewing system for vehicles. 4,214,266, Cl. 358-108.000.

Nachtrieb, Karl: *See—*
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.

Nagahori, Yukihiro, to Jeco Co., Ltd. Self-starting miniature synchronous motors. 4,214,181, Cl. 310-162.000.

Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, to Ube Industries, Ltd. Diphenyl ether derivatives and herbicidal compositions containing the same. 4,213,775, Cl. 71-103.000.

Nagai, Shigeki: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.

Nagao, Noriaki: *See—*
Fujino, Teruhisa; Osawa, Fujio; Nagao, Noriaki; and Hanji, Shigeo, 4,214,245, Cl. 343-103.000.

Nagaoka, Kiyosi: *See—*
Nakashima, Koichi; Nagaoka, Kiyosi; and Hikosaka, Toshihisa, 4,214,311, Cl. 364-482.000.

Nagel, Hans J.; and Schumacher, Egon, to Nagel, Hans J. Grated floor conveyor for poultry enclosure. 4,213,422, Cl. 119-21.000.

Nagelmeyer, Edward B. Energy transfer and air purifying devices. 4,213,769, Cl. 55-216.000.

Nagorny, Mikhail A.: *See—*
Koshman, Vitaly I.; Nagorny, Mikhail A.; and Petrichenko, Vladimir F., 4,214,291, Cl. 361-338.000.

Nakagaki, Harushige; Iwasaki, Syunji; and Fukushima, Isao, to Hitachi, Ltd. Frequency-voltage converter. 4,214,299, Cl. 363-8.000.

Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, to Sankyo Company Limited; and Ube Industries, Ltd. Agricultural fungicidal method. 4,213,987, Cl. 424-251.000.

Nakamura, Kenji: *See—*
Takeuchi, Masayuki; Nakamura, Kenji; and Handa, Masahiro, 4,213,288, Cl. 56-11.600.

Nakano, Akira: *See—*
Okuda, Naoki; and Nakano, Akira, 4,214,141, Cl. 219-73.000.

Nakao, Toshihiro: *See—*
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,214,281, Cl. 360-61.000.

Nakashima, Koichi; Nagaoka, Kiyosi; and Hikosaka, Toshihisa, to Sumitomo Metal Industries, Ltd. Method and apparatus for measuring insulation resistance. 4,214,311, Cl. 364-482.000.

Nakayama, Toyoo: *See—*
Fujii, Setsuro; Sakurai, Yojiro; Nakayama, Toyoo; and Matsui, Ryoji, 4,214,093, Cl. 560-34.000.

Nalco Chemical Company: *See—*
Albanese, Vincent M., 4,213,767, Cl. 55-5.000.

Namae, Takao; and Someya, Teruo, to Nihon Denshi Kabushiki Kaisha. Method and apparatus for correcting astigmatism in a scanning electron microscope or the like. 4,214,163, Cl. 250-311.000.

Nantin, Hans O. I.: *See—*
Ernstsson, Ernst G.; and Nantin, Hans O. I., 4,213,795, Cl. 134-22.00C.

Nara, Yasuhiro; Sohma, Yukio; and Hattori, Akira, to Fujitsu Limited. Error-correcting and error-detecting system. 4,214,228, Cl. 371-40.000.

Narasimhan, Keshavaiyengar Y.; Nathan, Robert; and Parthasarathy, Shakkottai P., to United States of America, National Aeronautics and Space Administration. System for plotting subsoil structure and method therefor. 4,214,226, Cl. 367-27.000.

Nathan, Robert: *See—*
Narasimhan, Keshavaiyengar Y.; Nathan, Robert; and Parthasarathy, Shakkottai P., 4,214,226, Cl. 367-27.000.

Nathanson, Marshall R.: *See—*
Stromsta, Roger R.; Nathanson, Marshall R.; and Morton, Dennis S., 4,214,287, Cl. 360-103.000.

National Research Development Corporation: *See—*
Foundos, Stavros, 4,213,251, Cl. 35-9.00R.

Nawata, Yoshiharu: *See—*
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.

Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, to Roussel Uclaf. Anorexigenic 3-phenyl-tetrahydropyridines. 4,213,989, Cl. 424-263.000.

Negishi, Akira: *See—*
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,214,097, Cl. 560-213.000.

Negroni, Eugenio; and Negroni, Roberto. Honeycomb muffle in tank furnaces for glass melting. 4,213,753, Cl. 432-247.000.

Negroni, Roberto: *See—*
Negroni, Eugenio; and Negroni, Roberto, 4,213,753, Cl. 432-247.000.

Neilson, John M. S., to RCA Corporation. Gate turn-off triac with dual low conductivity regions contacting central gate region. 4,214,255, Cl. 357-39.000.

Nelson, Peter F.: *See—*
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, 4,213,821, Cl. 162-72.000.

Nelson, Verner R.: *See—*
Immer, Hans U.; Nelson, Verner R.; and Gotz, Menfred K., 4,213,895, Cl. 260-112.50R.

Neumayr, Franz: *See—*
Datow, Joachim; Decker, Martin; Merkel, Karl; and Neumayr, Franz, 4,213,919, Cl. 260-544.00K.

Nevitt, Thomas D.: *See—*
McCaulay, David A.; and Nevitt, Thomas D., 4,214,116, Cl. 585-747.000.
New River Manufacturing Company, Inc.: *See—*
DeBrick, Eric, 4,213,399, Cl. 105-157.00R.
New York Society for the Relief of the Ruptured and Crippled: *See—*
Insall, John N.; and Walker, Peter S., 4,213,209, Cl. 3-1.911.
Nicholson, Albert N., to Computer Ribbon Systems, Inc. Apparatus for cleaning and re-inking printer ribbons. 4,213,419, Cl. 118-670.000.
Nida Corporation: *See—*
Gudelis, Drasutis; and Vetrane, David D., 4,213,253, Cl. 35-19.00A.
Nievelt, Frank J. Device for supporting tomato plants. 4,213,272, Cl. 47-45.000.
Nihon Atsuen Kogyo K.K.: *See—*
Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, 4,213,558, Cl. 228-176.000.
Nihon Denshi Kabushiki Kaisha: *See—*
Namae, Takao; and Someya, Teruo, 4,214,163, Cl. 250-311.000.
Niimi, Koji; Katoh, Mitsumi; and Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of wave memory reading type. 4,213,366, Cl. 84-1.010.
Niltsche, Rainer: *See—*
Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,214,159, Cl. 250-288.000.
Nippon Electric Co., Ltd.: *See—*
Mitani, Akira; and Sanguu, Isao, 4,213,583, Cl. 242-186.000.
Mizukami, Mineo, 4,214,262, Cl. 358-19.000.
Morito, Hiroshi, 4,214,270, Cl. 358-154.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Niimi, Koji; Katoh, Mitsumi; and Wachi, Masatada, 4,213,366, Cl. 84-1.010.
Nippon Selfoc Company, Limited: *See—*
Sugimoto, Shigetoki; Ishikawa, Ro; and Matsushita, Shigeo, 4,213,677, Cl. 350-96.180.
Nippon Steel Corporation: *See—*
Kawanami, Takao; Tajiri, Hiromi; and Uomori, Akiyoshi, 4,214,143, Cl. 219-97.000.
Nippondenso Co., Ltd.: *See—*
Kobayashi, Akio, 4,214,306, Cl. 364-431.000.
Nishimura, Kenji: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Nishimura, Minoru: *See—*
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.
Nissan Motor Company, Limited: *See—*
Abe, Fumiyuki; Hayashi, Yoshimasa; and Kimura, Akira, 4,213,440, Cl. 123-195.00C.
Minami, Hidehiro; and Aoki, Teruo, 4,213,430, Cl. 123-440.000.
Nitta, Issei: *See—*
Okushima, Hiromi; Nitta, Issei; and Furuya, Rikizo, 4,213,902, Cl. 260-239.570.
Nixdorf Computer AG: *See—*
Haftmann, Johannes; and Schmeykal, Rudolf, 4,213,715, Cl. 400-196.100.
Nixon, Ralph D., to English Electric Valve Company Limited. Mesh electrodes and method of making them. 4,214,025, Cl. 428-67.000.
Noda, Yoichiro: *See—*
Kiyono, Hiroshi; Ishimoto, Akio; Noda, Yoichiro; and Yada, Kozo, 4,213,925, Cl. 264-22.000.
Nolan, John L.; and Nordby, Harvey M., to Hollister Incorporated. Sealing and attachment assembly for medical drainage pouch. 4,213,458, Cl. 128-283.000.
Nolan, Peter D.: *See—*
Cameron, Gordon M.; Jones, Frederick W. S.; and Nolan, Peter D., 4,213,958, Cl. 423-522.000.
Noll, Klaus: *See—*
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, 4,214,001, Cl. 424-300.000.
Nordby, Harvey M.: *See—*
Nolan, John L.; and Nordby, Harvey M., 4,213,458, Cl. 128-283.000.
Noreika, Alexander J.; and Francombe, Maurice H., to Westinghouse Electric Corp. Deposition of solid semiconductor compositions and novel semiconductor materials. 4,213,781, Cl. 75-134.00P.
Norlin Music, Inc.: *See—*
Moog, Robert A., 4,213,367, Cl. 84-1.220.
Noto, Takao: *See—*
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.
Novanex Automation N.V.: *See—*
Laupman, Robert R., 4,213,515, Cl. 181-145.000.
Novaro Investments Limited: *See—*
Sandborn, Edmund B., 4,213,280, Cl. 52-309.900.
Novatome: *See—*
Carbonnel, Henri, 4,213,494, Cl. 164-4.000.
Nubani, Jawdat I.; and Sawicki, Frank S., to RCA Corporation. Wet carbon-dioxide treatment of partially-completed CRT. 4,213,663, Cl. 316-24.000.
Nuclear Supreme: *See—*
Waltrip, Owen R., 4,214,046, Cl. 429-198.000.
Nygren, Gordon W. Golf club head with center of gravity near its striking face. 4,213,613, Cl. 273-169.000.
Nyomura, Takashi: *See—*
Imamura, Takaaki; Kawagoe, Takahiro; Chikaraishi, Toshio; and Nyomura, Takashi, 4,214,058, Cl. 525-348.000.
Oberberger, Otto: *See—*
Eggert, Hans-Joachim; Zenkert, Heinrich; Kuehne, Rudi; and Oberberger, Otto, 4,213,532, Cl. 206-504.000.
Oberer, Walter. Cylindrical clamping mandrel for a buffing or polishing pad of specific size. 4,213,278, Cl. 51-368.000.
Occidental Petroleum Corporation: *See—*
White, William R.; and Van Tighem, Gary P., 4,213,851, Cl. 209-12.000.
Woinsky, Samuel G., 4,213,302, Cl. 60-641.000.
Occidental Research Corporation: *See—*
Holderness, Eugene R., 4,213,724, Cl. 414-133.000.
Sikdar, Subhas K.; and Moore, James H., 4,213,951, Cl. 423-339.000.
Sikdar, Subhas K., 4,213,952, Cl. 423-339.000.
O'Connor, John J., to Akzona Incorporated. Method for determining immunochemical substances. 4,213,764, Cl. 23-230.00B.
Oda, Kiroku: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Oda, Nobuo. Radio controlled wheel toy. 4,213,270, Cl. 46-254.000.
Oda, Yasuji: *See—*
Koide, Tsuyoshi; and Oda, Yasuji, 4,214,309, Cl. 364-474.000.
Odawara, Yoji: *See—*
Ishida, Masahiko; Haga, Ryoichi; and Odawara, Yoji, 4,213,857, Cl. 210-6.000.
Odberg, Paul-Johny: *See—*
Aanonsen, Bent; Odberg, Paul-Johny; and Samuelsen, Eirik, 4,213,712, Cl. 366-178.000.
Odell, Richard B.: *See—*
Roeseler, William G.; Warner, Gary J.; and Odell, Richard B., 4,213,587, Cl. 244-213.000.
O'Donnell, Leopold H.: *See—*
Hunt, Brian K.; and O'Donnell, Leopold H., 4,214,278, Cl. 360-14.000.
O'Donnell, Richard V., to United States of America, Army. Jamming of keyed continuous wave radio signals. 4,214,208, Cl. 455-1.000.
Oehmig, Robert G. Threshold and door sealing structure. 4,213,275, Cl. 49-468.000.
Offshore Devices, Inc.: *See—*
Milgram, Jerome H., 4,213,298, Cl. 60-369.000.
Ogawa, Haruki: *See—*
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.
Ogden, Ralph. Tape and tape reader arrangement for programmable controllers. 4,214,153, Cl. 235-376.000.
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, to Seiko Koko Kabushiki Kaisha. Time detecting switch for alarm clock. 4,214,134, Cl. 200-37.00R.
Ogoshi, Toshiaki: *See—*
Hayashi, Akira; Ohkouchi, Haruo; Kitano, Kyozo; and Ogoshi, Toshiaki, 4,213,918, Cl. 260-513.00T.
Ohkouchi, Haruo: *See—*
Hayashi, Akira; Ohkouchi, Haruo; Kitano, Kyozo; and Ogoshi, Toshiaki, 4,213,918, Cl. 260-513.00T.
Ohlinger, Manfred: *See—*
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.
Ohno, Takeshi: *See—*
Mino, Masao; and Ohno, Takeshi, 4,213,574, Cl. 242-43.200.
Ohta, Tazuo: *See—*
Komatsu, Makoto; Ohta, Tazuo; Tanaka, Toru; and Akagi, Kimiko, 4,214,100, Cl. 562-416.000.
Ohuchi, Kenji: *See—*
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,213,541, Cl. 222-92.000.
Oie, Naoyuki: *See—*
Sakamoto, Kiyoshi; Tsukakoshi, Yukio; and Oie, Naoyuki, 4,213,679, Cl. 353-72.000.
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, to Chugai Seiyaku Kabushiki Kaisha. Antibiotic No. 2-200 and process for producing thereof. 4,214,091, Cl. 549-62.000.
Ojima, Teruhiko: *See—*
Yoneyama, Tetsuhito; Tomizawa, Shiro; Hori, Tetsuo; and Ojima, Teruhiko, 4,213,803, Cl. 148-102.000.
Okaguchi, Sigeki: *See—*
Yasui, Yasuyosi; Izuta, Mitugu; and Okaguchi, Sigeki, 4,213,660, Cl. 308-177.000.
Okajima, Keisuke: *See—*
Tokita, Yoshiaki; and Okajima, Keisuke, 4,214,305, Cl. 364-200.000.
Okamura, Yoshinao: *See—*
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, 4,213,596, Cl. 254-134.30R.
Okazaki, Hiroshi: *See—*
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.
Okuda, Naoki; and Nakano, Akira, to Kobe Steel, Ltd. Multiple electrode submerged arc welding method. 4,214,141, Cl. 219-73.000.

Okuma Machinery Works Ltd.: *See*—
Watanabe, Toshiaki; and Yuhara, Hideo, 4,214,191, Cl. 318-561.000.
Okushima, Hiromi; Nitta, Issei; and Furuya, Rikizo, to Mitsubishi Chemical Industries Ltd. Process for producing steroidal 7α-acylthio-4-en-3-ones. 4,213,902, Cl. 260-239.570.
Olausson, Gun A.: *See*—
af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,214,049, Cl. 435-23.000.
Olausson, Karl A.: *See*—
Lis, Per-Arne; and Olausson, Karl A., 4,213,405, Cl. 110-234.000.
Olberz, Norbert J.; and Hagmueller, Artie, to Olberz, Norbert J., a part interest. Sole for hiking boots and the like. 4,213,255, Cl. 36-32.00R.
Oldham Batteries Limited: *See*—
Morton, Harold, 4,214,295, Cl. 362-164.000.
Olesen, Lykke. Method and device for supervising the speed of an object. 4,214,265, Cl. 358-93.000.
Olin Corporation: *See*—
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,213,496, Cl. 164-147.000.
Olschewski, Armin; and Huber, Wolfgang, to SKF Kugellagerfabriken GmbH. Drilling bit. 4,213,656, Cl. 308-8.200.
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., to Foxboro Company, The. Transducer assembly providing pneumatic output proportional to electrical input signal. 4,213,478, Cl. 137-85.000.
Olympus Optical Co., Ltd.: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,214,281, Cl. 360-61.000.
Sato, Masanobu; and Furuta, Kenzi, 4,214,282, Cl. 360-69.000.
Omori, Masahiro; Wholey, James N.; and Anderson, J. Ross, to Avantek, Inc. Low-resistance, fine-line semiconductor device and the method for its manufacture. 4,213,840, Cl. 204-192.00C.
Onishi, Sigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. 2-Cycle engine of an active thermostmosphere combustion type. 4,213,431, Cl. 123-73.00R.
Onoda Cement Co., Ltd.: *See*—
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,213,541, Cl. 222-92.000.
Onofrio, Carmen. Air-filter purger for internal combustion engines. 4,213,437, Cl. 123-179.00A.
Opprecht, Paul. Resistance welding machine for seam welding of blanks or the like. 4,214,140, Cl. 219-61.300.
Orum, Paul R.; and Vyvial, Larry A., to ACF Industries, Incorporated. Manual override for hydraulic gate valve actuators. 4,213,480, Cl. 137-556.000.
Osawa, Fujio: *See*—
Fujino, Teruhisa; Osawa, Fujio; Nagao, Noriaki; and Hanji, Shigeo, 4,214,245, Cl. 343-103.000.
Osenkarski, Paul D., to Graphic Controls Corporation. Body electrode with indicator to ensure optimal securement. 4,213,463, Cl. 128-639.000.
O'Shea, Martin W., to Sprague Electric Company. Electromagnetic noise source locator. 4,214,210, Cl. 455-282.000.
Oshima, Ryoichiro: *See*—
Azuhata, Shigeru; Akimoto, Hidetoshi; Kikuchi, Hideo; Hishinuma, Yukio; Oshima, Ryoichiro; and Arikawa, Yoshijiro, 4,213,944, Cl. 423-235.000.
Oswald, Donald E., to Kaiser Steel Corporation. Enlongated bar support means for the spray coating and conveying of drum parts. 4,213,418, Cl. 118-635.000.
Oswald, Richard K., to International Business Machines Corporation. Clocking system for servo signal having two or more harmonically related frequencies. 4,214,279, Cl. 360-51.000.
Otsuka, Kei; Shigehara, Masamichi; and Yokokawa, Sumio, to Fuji Electric Co., Ltd. Stabilizing equipment for power transmission system. 4,214,289, Cl. 361-20.000.
Ottewell, Roger J.; and Lowe, Jack M., to Dunlop Limited. Hose. 4,213,485, Cl. 138-130.000.
Otto Fuchs KG: *See*—
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, 4,213,236, Cl. 29-243.500.
Ottoson, Allen E., to Vee Arc Corporation. Tension controlling. 4,214,190, Cl. 318-356.000.
Oules, Michel L., to S.I.L.E.C.-Division Signalisation Industrielle. Intrinsically safe telephone network. 4,214,127, Cl. 179-2.00R.
Outboard Marine Corporation: *See*—
Cavil, David T.; and McAuliffe, Gerald N., 4,214,288, Cl. 361-6.000.
Owen, Marvin L.: *See*—
Coha, Thomas F.; and Owen, Marvin L., 4,213,415, Cl. 116-28.100.
Owens-Corning Fiberglas Corporation: *See*—
Bennett, Joe B., 4,213,641, Cl. 285-369.000.
Owens, Dean P., to Carborundum Company, The. Method for manufacture of neutron absorbing articles. 4,213,883, Cl. 252-478.000.
Owens-Illinois, Inc.: *See*—
Ernsthausen, Roger E., 4,214,183, Cl. 313-221.000.
Oxford Hill, Ltd.: *See*—
Thiele, Geraldine H., 4,214,006, Cl. 424-318.000.
Oy Lival AB: *See*—
Jaakkola, Aarno, 4,213,591, Cl. 248-281.100.
Oy Wartsila AB: *See*—
Kanervo, Seppo, 4,213,361, Cl. 83-30.000.
Ozaki, Takashi: *See*—
Kuwako, Tomohisa; Ozaki, Takashi; and Iwase, Yoshitaka, 4,214,180, Cl. 310-80.000.
Packer, Marvin, to RCA Corporation. Sealing composition. 4,214,067, Cl. 528-93.000.
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., to Texas Instruments Incorporated. Silicon refinery. 4,213,937, Cl. 422-142.000.
Pako Corporation: *See*—
Strunc, Gerald R., 4,214,310, Cl. 364-475.000.
Pallmann KG Maschinenfabrik: *See*—
Pallmann, Wilhelm, 4,213,572, Cl. 241-292.100.
Pallmann, Wilhelm, to Pallmann KG Maschinenfabrik. Blade holder. 4,213,572, Cl. 241-292.100.
Palmer, Lewis B.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.
Pandolfi, Alberto S. Water proportioning and delivering device particularly for coffee machines. 4,213,544, Cl. 222-250.000.
Panepinto, William, Jr.: *See*—
Joyce, Thomas F.; Holtey, Thomas O.; and Panepinto, William, Jr., 4,214,303, Cl. 364-200.000.
Papa, Christopher M., to Johnson & Johnson. Zinc salt of all-trans-retinoic acid for the treatment of acne. 4,214,000, Cl. 424-289.000.
Papasideris, Stamos I., to Caterpillar Tractor Co. Instrument panel assembly. 4,214,227, Cl. 340-52.00F.
Parcero-de Zarzosa, Ma. Hilda: *See*—
Zarzosa-Castilla, Agustin F.; and Parcero-de Zarzosa, Ma. Hilda, 4,213,281, Cl. 52-323.000.
Paris, Guy: *See*—
Engelhard, Philippe; Legendre, Michel; Paris, Guy; and Szabo, Georges, 4,213,849, Cl. 208-139.000.
Park, Thomas R.: *See*—
Cattorini, Joseph F.; Park, Thomas R.; and Martin, John K., 4,213,601, Cl. 270-61.00F.
Parker, Edward J.; and Behlen, James C., Jr., to Advanced Technology Laboratories, Inc. Real time digital scan converter. 4,214,269, Cl. 358-140.000.
Parker, James J.: *See*—
Bafaro, Michael P.; and Parker, James J., 4,214,188, Cl. 315-382.000.
Parthasarathy, Shakkottai P.: *See*—
Narasimhan, Keshavaiyengar Y.; Nathan, Robert; and Parthasarathy, Shakkottai P., 4,214,226, Cl. 367-27.000.
Partington, Everett J. Attachment for saber saw. 4,213,242, Cl. 30-374.000.
Pasch, Lambert; and Wagemann, Heinz, to Uniroyal A.G. Insulation plate formation. 4,213,814, Cl. 156-242.000.
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, to Societe Nationale des Poudres et Explosifs. Poly-(carbonate-urethane)-triols and preparation thereof. 4,214,073, Cl. 528-369.000.
Pasternack, Adalbert: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,213,453, Cl. 128-202.260.
Patlico Rights N.V.: *See*—
van Kuijk, Josephus P. M., 4,213,563, Cl. 237-2.00B.
Patterson, Robert E., to M. P. H. Industries, Inc. Harmonic detector for traffic radar. 4,214,243, Cl. 343-8.000.
Pavlicek, Frank V.: *See*—
Spiess, Frederick N.; Boegeman, Dwight E.; Pavlicek, Frank V.; and Lowenstein, Carl D., 4,214,314, Cl. 367-2.000.
Peabody, William A.; and Schaaf, Ernest M., to Peabody, William A. Method and apparatus for increasing air conditioner efficiency. 4,213,306, Cl. 62-85.000.
Pearson, Leland E., to Industrial & Municipal Engineering, Inc. Eduction unit. 4,213,479, Cl. 137-493.000.
Pedler, Keith. Firearm safety device. 4,213,375, Cl. 89-31.000.
Peffer, Robert M.; and Braun, Charles H., to Eastman Kodak Company. Method and apparatus for locating a moving sheet at a registration position. 4,213,603, Cl. 271-229.000.
Peralta, Bernal: *See*—
Riddick, Frank C., Jr.; and Peralta, Bernal, 4,213,850, Cl. 208-216.00R.
Perez, Gilbert H. Modular solar collector panel and manifold therefor. 4,213,450, Cl. 126-448.000.
Perez, Ricardo L.: *See*—
Tefft, Franklin A.; Perez, Ricardo L.; and Barnum, Ronald E., 4,213,584, Cl. 244-17.130.
Permelec Electrode Ltd.: *See*—
Sato, Hideo; and Shimamune, Takayuki, 4,213,843, Cl. 204-290.00F.
Perrot, Friedrich, to ETA A.G. Ebauches-Fabrik. Arrangement for securing a dial to a plate in a timepiece. 4,213,295, Cl. 368-236.000.
Persson, Frederick M.; and Frankel, David C., to General Motors Corporation. Method and apparatus to detect automatic wire bonder failure. 4,213,556, Cl. 228-104.000.
Peter, Cornelius; and Kraus, Bernd, to Robert Bosch GmbH. Flow rate meter with temperature dependent resistor. 4,213,335, Cl. 73-204.000.
Peterson, Gary R.: *See*—
Bazin, Lucas J.; Peterson, Gary R.; and Schneider, Dennis M., 4,214,261, Cl. 358-19.000.
Peterson, William A., Jr.; and Marchak, Roman O., to Bendix Corporation, The. Deceleration lean out feature for electronic fuel management systems. 4,214,307, Cl. 364-431.000.

Petrichenko, Vladimir F.: *See*—
Koshman, Vitaly I.; Nagorny, Mikhail A.; and Petrichenko, Vladimir F., 4,214,291, Cl. 361-338.000.
Petrolite Corporation: *See*—
Bellos, Thomas J.; and Davis, James E., 4,213,934, Cl. 422-15.000.
Petruzzi, Thomas G.; Ashton, Harold P.; and Conti, Rino, to Dart Industries Inc. Planter. 4,213,271, Cl. 47-39.000.
Pevsner, Paul H. Miniature balloon catheter. 4,213,461, Cl. 128-348.000.
Pfaudler Werke A.G.: *See*—
Kaessner, Hugo; and Loehr, Wilhelm, 4,213,713, Cl. 366-279.000.
Pfeiffer, Ferdinand; and Rottwinkel, Leo, to Messer Griesheim GmbH. Process and device for evaporating large quantities of low boiling liquefied gases. 4,213,501, Cl. 169-46.000.
Pfister GmbH: *See*—
Hafner, Hans W., 4,213,509, Cl. 177-199.000.
Pfizer Inc.: *See*—
Bindra, Jasjit S., 4,213,907, Cl. 260-343.30P.
Corey, Elias J.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,214,099, Cl. 560-256.000.
Richardson, Kenneth; Plews, Rhona M.; and Wright, James R., 4,214,074, Cl. 536-10.000.
Philippi, George J. Practice weight attachment for golf clubs and method of weighting same. 4,213,614, Cl. 273-194.00B.
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., to Imperial Chemical Industries Limited. Reactive dyestuffs containing chlorine or fluorine substituents and one or more pyridine radicals linked to the dyestuff at the 2-, 4- or 6-position. 4,213,899, Cl. 260-156.000.
Phillips Petroleum Company: *See*—
Blackwell, Jennings P., 4,214,021, Cl. 427-385.00R.
Blake, Larry V.; Womeldorph, Donald E., Jr.; Surber, Oliver M.; and James, John P., 4,213,856, Cl. 209-250.000.
Boultinghouse, Harold D., 4,213,812, Cl. 156-226.000.
Hunt, Harold R.; and Mills, King L., 4,213,957, Cl. 423-450.000.
Kosinsky, Edward J., 4,213,869, Cl. 252-37.500.
Makovec, Donald J.; and Hutson, Thomas, Jr., 4,214,115, Cl. 585-716.000.
Rakes, James L.; and Harder, Joseph R., 4,214,030, Cl. 428-212.000.
Schmidt, Thomas W., 4,214,158, Cl. 250-281.000.
Stapp, Paul R., 4,213,879, Cl. 252-429.00R.
Phoenix Products, Inc.: *See*—
Hibbard, Linda A., 4,213,549, Cl. 224-209.000.
Piccirillo, Gary P.: *See*—
Murray, Ronald A.; and Piccirillo, Gary P., 4,213,665, Cl. 339-17.00D.
Pichler, Ludwig: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, 4,213,995, Cl. 424-273.00R.
Pickles, Wilfred: *See*—
Baylis, Eric K.; and Pickles, Wilfred, 4,213,969, Cl. 424-177.000.
Pieper, Helmut: *See*—
Engelhardt, Gunther; Keck, Johannes; Kruger; Noll, Klaus; and Pieper, Helmut, 4,214,001, Cl. 424-300.000.
Pierron, Claude; and Kirchgaesser, Johannes, to A. Raymond. Clamp for securing round articles. 4,213,589, Cl. 248-74.00R.
Pietsch, Helge; and Lange, Gerd. Vehicle seat. 4,213,594, Cl. 248-550.000.
Pifer, William J. Recreational vehicle multi-level cooler. 4,213,309, Cl. 62-332.000.
Pilhall, Stig T. L., to AB Volvo. Interiorly adjustable outside rear view mirror for vehicles. 4,213,675, Cl. 350-307.000.
Pilz, Georg: *See*—
Eckell, Albrecht; Matthies, Paul; Pilz, Georg; and Rotzoll, Rudi-Heinz, 4,213,884, Cl. 260-29.20N.
Pinto, Alwyn, to Imperial Chemical Industries Limited. Ammonia production process. 4,213,954, Cl. 423-359.000.
Pioneer Electronic Corporation: *See*—
Fushimi, Akihiro; Tabara, Noboru; and Isaki, Mikio, 4,214,283, Cl. 360-71.000.
Yokogawa, Tomohisa, 4,214,211, Cl. 455-287.000.
Pirzer, Hans: *See*—
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, 4,214,072, Cl. 528-272.000.
Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Use of cyclohexene-(1)-dione-(3,6)-tetraalkyl diketals. 4,214,104, Cl. 568-648.000.
Pitney Bowes, Inc.: *See*—
Check, Frank T., Jr.; and Sansone, Ronald P., 4,214,157, Cl. 250-236.000.
Plazanet, Jacques: *See*—
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,214,073, Cl. 528-369.000.
Plessey Handel und Investments AG: *See*—
Dickson, John F., 4,214,174, Cl. 307-229.000.
Pletcher, Robert W.: *See*—
Wooding, David L.; and Pletcher, Robert W., 4,213,794, Cl. 134-6.000.
Plews, Rhona M.: *See*—
Richardson, Kenneth; Plews, Rhona M.; and Wright, James R., 4,214,074, Cl. 536-10.000.
Plotnikov, Vladimir A.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.
Plough, Inc.: *See*—
Levine, Donald J., 4,213,979, Cl. 424-243.000.
Plummer, Ernest L., to FMC Corporation. Insecticidal cyclopropanecarboxylates from substituted [1,1'-biphenyl]-3-ylmethyl compounds. 4,214,004, Cl. 424-305.000.
Poe, L. Richard; and Bourne, William R., to Hartwell Corporation. Rotary latch and method of operation. 4,213,642, Cl. 292-241.000.
Poirier, Norbert: *See*—
Minkiewicz, Andre E.; and Poirier, Norbert, 4,213,555, Cl. 228-29.000.
Polaroid Corporation: *See*—
Land, Edwin H., 4,214,285, Cl. 360-90.000.
Polovnikov, Sergei V.; Zaznobin, Anatoly M.; Masalov, Gennady F.; and Mischenkov, Alexandr A. Method and apparatus for testing cyclically operated mechanical members for defects. 4,213,346, Cl. 73-660.000.
Polymer Corporation, The: *See*—
Goebel, Charles V., Jr., 4,214,065, Cl. 528-27.000.
Polysar International, S.A.: *See*—
Porter, David, 4,214,053, Cl. 521-70.000.
Polysius AG: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.
Pomerantzeff, Oleg; and Webb, Robert H., to Retina Foundation. Scanning ophthalmoscope for examining the fundus of the eye. 4,213,678, Cl. 351-7.000.
Pope, George A.; and Bourne, Alan J., to Dunlop Limited. Pneumatic tire containing water-dispersible puncture sealant. 4,213,491, Cl. 152-330.00L.
Popper, Jay, to Standard Microsystems Corp. Synchronous binary counter utilizing a pipeline toggle signal propagation technique. 4,214,173, Cl. 307-224.00C.
Porta, Paolo D.; and Rabusin, Elio, to S.A.E.S. Getters S.p.A. Getter comprising U-shaped, parallel, linear channels containing getter material. 4,214,184, Cl. 313-481.000.
Portass, Michael L., to Vickers Limited. Tensioning of members. 4,213,720, Cl. 405-195.000.
Porter, David, to Polysar International, S.A. Latex foam rubber. 4,214,053, Cl. 521-70.000.
Porter, John P., to B. F. Goodrich Company, The. Surface irregularity analyzer. 4,213,331, Cl. 73-105.000.
Pottratz, Ronald, Jr.: *See*—
Hardesty, Robert D., 4,213,628, Cl. 280-412.000.
Pottratz, Tom: *See*—
Hardesty, Robert D., 4,213,628, Cl. 280-412.000.
Poulsen, Martin E.: *See*—
Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., 4,213,698, Cl. 355-77.000.
Powers Manufacturing, Inc: *See*—
Bryant, Nelson; and Hoppe, Rudy, 4,213,702, Cl. 356-239.000.
PPG Industries, Inc.: *See*—
Bonaddio, Robert M., 4,213,550, Cl. 225-2.000.
Crano, John C., 4,213,948, Cl. 423-292.000.
Rinehart, Jay K., 4,213,915, Cl. 260-455.00A.
Praxl, Werner; and Ehret, Reiner, to Dr. Werner Freyberg, Chemische Fabrik Delitia Nachf. Pesticide containing ignition inhibitor. 4,213,967, Cl. 424-128.000.
Precise Metal Parts Company: *See*—
Silverman, John H.; and Cahill, James P., 4,213,284, Cl. 53-74.000.
Prescott, John F., Jr.; and Roberts, William H., to General Motors Corporation. Flow bench. 4,213,327, Cl. 73-38.000.
Price, Howard C. Board game with movable playing pieces. 4,213,615, Cl. 273-260.000.
Priebe, Fritz, to Schloemann-Siemag Aktiengesellschaft. Apparatus for fitting an extrusion die holder onto the press stem of an indirect metal extrusion press. 4,213,318, Cl. 72-21.000.
Procter & Gamble Company, The: *See*—
McCarty, Charles B.; and Seiden, Paul, 4,214,038, Cl. 428-411.000.
Strube, Herbert E., 4,214,011, Cl. 426-591.000.
Product Research and Development: *See*—
Hartley, E. Dale, 4,214,137, Cl. 200-83.00P.
Production Experts, Inc.: *See*—
Sroub, Joseph W., 4,213,650, Cl. 297-281.000.
Properzi, Giulio. Rolling method and rolling mill for an ingot originating from a continuous casting machine of the wheel-and-belt type. 4,213,321, Cl. 72-235.000.
Propst, Robert L.; Randolph, Travis M.; and Reyda, Theodore M., to Herman Miller, Inc. Combination acoustic conditioner and light fixture. 4,214,298, Cl. 362-253.000.
Pugsley, Peter C.; and Wood, Peter J., to Crosfield Electronics Limited. Printing methods for producing prints having images of variable size and text. 4,214,276, Cl. 358-256.000.
Pullman Incorporated: *See*—
Knippel, Willis H., 4,213,725, Cl. 414-387.000.
Synder, Richard C.; Sims, Roger D.; and Rousseau, George L., 4,213,400, Cl. 105-199.00C.
Purdue Frederick Company, The: *See*—
Hofer, Peter, 4,214,059, Cl. 525-356.000.
Pye (Electronic Products) Ltd.: *See*—
Ellson, Allan H., 4,213,455, Cl. 128-214.00E.
Pyle, Walter R., to Chevron Research Company. Valve means responsive to the operation of a vapor-seal valve for preventing fuel spillage from the discharge spout of a vapor-recovery fuel dispensing nozzle. 4,213,488, Cl. 141-1.000.
Pyzel, Robert. Fluid bed reactor. 4,213,938, Cl. 422-143.000.

Queen, Daniel L., to Chamberlain Manufacturing Corp. Wide range magnetically biased reed switch. 4,214,220, Cl. 335-153.000.

Questad, Philip J., to Teltone Corporation. Signal coupler. 4,214,130, Cl. 179-81.00R.

R. E. Phelon Company, Inc.: *See*—
Burson, Bob O., 4,213,436, Cl. 123-599.000.

Rabinovich, Vladimir B.: *See*—
Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B., 4,213,834, Cl. 204-129.250.

Rabusin, Elio: *See*—
Porta, Paolo D.; and Rabusin, Elio, 4,214,184, Cl. 313-481.000.

Raczynski, Robert F.: *See*—
Zudkevitch, David; Khanna, Nirmal K.; and Raczynski, Robert F., 4,213,832, Cl. 203-95.000.

Rae, Donald A. Card with removable three dimensional figurine. 4,213,531, Cl. 206-463.000.

Ragard, Phillip A., to Universal Instruments Corporation. Component sequencing and taping machine. 4,213,286, Cl. 53-493.000.

Raggenbass, Werner; and Zwar, Kurt, to BBC Brown Boveri & Company Limited. Monitoring circuit. 4,214,177, Cl. 307-355.000.

Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., to Swiss Aluminium Ltd. Improving the electrical conductivity of aluminum alloys through the addition of mischmetal. 4,213,799, Cl. 148-2.000.

Raghavan, Mathur: *See*—
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,800, Cl. 148-2.000.

Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Flexible disk pack and improved transducing-manipulation thereof. 4,214,286, Cl. 360-99.000.

Raimondi, Peter K.: *See*—
Jones, George R.; and Raimondi, Peter K., 4,214,271, Cl. 358-166.000.

Rakes, James L.; and Harder, Joseph R., to Phillips Petroleum Company. Thermoformable-crosslinkable ethylene polymer sheet per se and in laminate form and thermoformed sheet produced therefrom. 4,214,030, Cl. 428-212.000.

Ramsay, George S. Smoker's pipe having a hollow pipe body formed from metallic half sections. 4,213,469, Cl. 131-199.000.

Ranco Incorporated: *See*—
Rossi, Guglielmo; and Bosing, Hans, 4,214,136, Cl. 200-67.0DA.

Randolph, Travis M.: *See*—
Propst, Robert L.; Randolph, Travis M.; and Reyda, Theodore M., 4,214,298, Cl. 362-253.000.

Rathbun, Loren L.: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., 4,213,332, Cl. 73-134.000.

Ratliff, Willa Dean L. Woman's outer garment and pattern therefor. 4,213,203, Cl. 2-79.000.

Raudenbusch, Werner T.: *See*—
Schreurs, Gerardus C. M.; Raudenbusch, Werner T.; and Visser, Theodorus N., 4,214,068, Cl. 528-98.000.

Raygo Wagner, Inc.: *See*—
Robnett, James J.; and Thomas, Dennis R., 4,213,726, Cl. 414-420.000.

Raymond, Samuel O.; and Hayward, Gary G., to Benthos, Inc. Method and apparatus for inspecting containers. 4,213,329, Cl. 73-52.000.

Rayner, Ross H. Clothes line separator. 4,213,597, Cl. 254-388.000.

Raypak Produkten B.V.: *See*—
Widdershoven, Louis H., 4,213,406, Cl. 110-326.000.

RCA Corporation: *See*—
Bazin, Lucas J.; Peterson, Gary R.; and Schneider, Dennis M., 4,214,261, Cl. 358-19.000.
Bohringer, Walter, 4,214,189, Cl. 315-408.000.
Ferrie, Ronald G., 4,214,213, Cl. 328-117.000.
Gale, Michael T., 4,213,673, Cl. 350-162.0SF.
Halon, Bernard; and Hoffman, Dorothy M., 4,214,018, Cl. 427-100.000.
Neilson, John M. S., 4,214,255, Cl. 357-39.000.
Nubani, Jawdat I.; and Sawicki, Frank S., 4,213,663, Cl. 316-24.000.
Packer, Marvin, 4,214,067, Cl. 528-93.000.
Rosnowski, Wojciech, 4,213,807, Cl. 148-187.000.
Williams, Richard; and Arie, Yehuda, 4,213,798, Cl. 136-89.0SJ.
Wipff, Frank P., 4,214,126, Cl. 179-1.50M.

Read, Martin A., to Lucas Industries Limited. Internal combustion engine fuel injection control. 4,213,425, Cl. 123-478.000.

Recortec, Inc.: *See*—
Chang, David T. L., 4,214,259, Cl. 358-8.000.

Reed, Weldon N.: *See*—
Bristowe, William W.; Ford, Ernest C., Jr.; and Reed, Weldon N., 4,213,837, Cl. 204-159.190.

Reeher, John R.: *See*—
Fies, William J.; Smith, Ronald D.; Reeher, John R.; and Story, Michael S., 4,214,160, Cl. 250-292.000.

Reese, Eckart: *See*—
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,214,062, Cl. 525-470.000.

Refratechnik GmbH: *See*—
Bartha, Peter; and Tutsek, Alexander, 4,213,789, Cl. 106-52.000.

Reich, Heinrich; and Eibofner, Eugen, to Kaltenbach & Voigt GmbH & Co. Dental-instrument handle. 4,213,756, Cl. 433-126.000.

Reimer, Jan D.: *See*—
Lemons, Kyle E.; Blish, Richard C., II; and Reimer, Jan D., 4,213,818, Cl. 156-643.000.

Reinehr, Dieter, to Ciba-Geigy Corporation. 1-Aza-1,5,9-cyclododecatrienes. 4,213,901, Cl. 260-239.0BE.

Reinertson, John E.; and Wells, John L., to MedaSonics, Inc. Self-calibrating automatic zeroing strain gauge circuit. 4,213,348, Cl. 73-765.000.

Reinstadler, Kenneth A.; and Davidson, William E., to General Electric Company. Steam iron water gauge. 4,213,258, Cl. 38-77.200.

Reiter Machine Works, Ltd.: *See*—
Schefer, Kurt; and Fluck, Jakob, 4,213,573, Cl. 242-18.00A.

Reitlinger, Adolf: *See*—
Mellen, Arthur J.; and Reitlinger, Adolf, 4,214,215, Cl. 330-277.000.

Reliance Telecommunication Electronics Company: *See*—
Kimbrough, Mahlon D., 4,214,129, Cl. 370-57.000.

Remenyi, Janos: *See*—
Csikos, Rezso; Balogh, Andras; Herendi, Jozsef; Farkas, L. Peter; Remenyi, Janos; and Koltay, Sandor, 4,214,032, Cl. 428-280.000.

Rempfler, Hermann: *See*—
Schurter, Rolf; Rempfler, Hermann; and Bohner, Beat, 4,213,774, Cl. 71-94.000.

Rems-Werk Christian Foll und Sohne GmbH & Co.: *See*—
Wagner, Rudolf, 4,213,722, Cl. 408-73.000.
Wagner, Rudolf, 4,213,723, Cl. 408-239.00A.

Renheim, Gunnar, to Siemens Aktiengesellschaft. Electroencephalograph. 4,213,465, Cl. 128-731.000.

Rescorla, Charles L.: *See*—
Rubenstein, Raymond D.; and Rescorla, Charles L., 4,213,511, Cl. 180-139.000.

Respiratory Care, Inc.: *See*—
Cambio, Orlando D., 4,213,933, Cl. 264-515.000.

Retina Foundation: *See*—
Pomerantzeff, Oleg; and Webb, Robert H., 4,213,678, Cl. 351-7.000.

Reubke, Karl-Julius: *See*—
Berg, Gerhard; Hohmann, Walter; Reubke, Karl-Julius; and Wunderlich, Klaus, 4,213,909, Cl. 260-371.000.

Reuter, Edward J., to Reuter, Inc. Container cover hinge means. 4,213,539, Cl. 220-333.000.

Reuter, Inc.: *See*—
Reuter, Edward J., 4,213,539, Cl. 220-333.000.

Reyda, Theodore M.: *See*—
Propst, Robert L.; Randolph, Travis M.; and Reyda, Theodore M., 4,214,298, Cl. 362-253.000.

Rezendes, Paul W.: *See*—
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,213,478, Cl. 137-85.000.

Rhone-Poulenc Industries: *See*—
Bargain, Michel; and Lefort, Marcel, 4,213,914, Cl. 556-419.000.
Blanc, Jean-Pierre; and Meiller, Francois, 4,213,785, Cl. 106-38.350.
Meyer, Jacques; and Bernelin, Daniel, 4,214,040, Cl. 428-458.000.

Rhone-Poulenc-Textile: *See*—
Couchoud, Paul; and Vaginay, Yves, 4,214,069, Cl. 528-167.000.

Rialan, Joseph: *See*—
Douaud, Andre; and Rialan, Joseph, 4,213,429, Cl. 123-414.000.

Richard Seifert & Co. GmbH & Co. KG: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, 4,213,552, Cl. 226-170.000.

Richardson Company, The: *See*—
Jutte, Gottfried W.; and McHugh, John V., 4,214,045, Cl. 429-87.000.

Richardson, Kenneth; Plews, Rhona M.; and Wright, James R., to Pfizer Inc. Hydroxyalkyl derivatives of aminoglycoside antibiotics. 4,214,074, Cl. 536-10.000.

Richmond, Thomas A., to Avnet, Incorporated. Tunable fiberglass whip antenna. 4,214,247, Cl. 343-752.000.

Ricoh Company, Ltd.: *See*—
Furukawa, Masamichi, 4,213,683, Cl. 354-24.000.
Imai, Chikara; Tatsumi, Susumu; and Eda, Tadahiro, 4,213,693, Cl. 355-14.00D.
Yamauchi, Satoshi, 4,214,257, Cl. 358-3.000.

Riddick, Frank C., Jr.; and Peralta, Bernal, to Union Oil Company of California. Hydrodesulfurization of oil feedstock with presulfided catalyst. 4,213,850, Cl. 208-216.00R.

Ridyard, Denis R. A.; and Taylor, Charles W., to Imperial Chemical Industries Limited. Coloration process: mixed dyes for differential-dyeing nylon mixtures. 4,213,759, Cl. 8-643.000.

Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, to Mannesmannufer Aktiengesellschaft; and Richard Seifert & Co. GmbH & Co. KG. Conveyor belt for filmstrip positioning. 4,213,552, Cl. 226-170.000.

Rinehart, Jay K., to PPG Industries, Inc. N-Halo-alkyl thiolcarbamates and N-alkenyl thiolcarbamates. 4,213,915, Cl. 260-455.00A.

Ritzmann, Horst: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Robb, Frank B.: *See*—
Whitaker, James L., 4,213,529, Cl. 206-427.000.

Robert Bosch GmbH: *See*—
Hofmann, Karl, 4,213,568, Cl. 239-533.400.
Peter, Cornelius; and Kraus, Bernd, 4,213,335, Cl. 73-204.000.
Vogtmann, Hans-Jorg; and Stumpp, Gerhard, 4,213,434, Cl. 123-462.000.

Roberts, Samuel A. Pump for central heating system. 4,213,745, Cl. 417-363.000.

Roberts, William H.: *See*—
Prescott, John F., Jr.; and Roberts, William H., 4,213,327, Cl. 73-38.000.
Robertshaw Controls Company: *See*—
Bauer, Werner R., 4,213,483, Cl. 137-625.290.
Brakebill, Harold G., 4,213,233, Cl. 29-157.10R.
Lewis, Jay L., 4,213,457, Cl. 128-276.000.
Wooding, Robert L., 4,213,291, Cl. 368-263.000.
Robinson, James W., Jr. Automatic fishing apparatus. 4,213,264, Cl. 43-16.000.
Robnett, James J.; and Thomas, Dennis R., to Raygo Wagner, Inc. Container carrier vehicle. 4,213,726, Cl. 414-420.000.
Roeschlaub, Ronald C.; and Fegel, Albert, to Irontite Products, Inc. Apparatus for fluid pressure testing of engine cylinder heads and similar parts. 4,213,328, Cl. 73-49.700.
Roese, John A.; and Turner, A. Franklin. Stereofluoroscopy system. 4,214,267, Cl. 358-111.000.
Roeseler, William G.; Warner, Gary J.; and Odell, Richard B., to Boeing Company, The. Hinge arrangement for control surfaces. 4,213,587, Cl. 244-213.000.
Rogers, Francis R.; and Eastman, James M., to Bendix Corporation, The. Variable flow ejector. 4,213,741, Cl. 417-79.000.
Rohm, Gunter H. Lockable chuck for hammer drill. 4,213,622, Cl. 279-1.00K.
Rohm, Gunter H. Nonloosening drill chuck. 4,213,623, Cl. 279-1.00C.
Rohner, Peter, to Kabel-und Metallwerke Gutehoffnungshuette AG. Winding device. 4,213,582, Cl. 242-110.000.
Romine, Ernest H. Thread compliance gauge. 4,213,247, Cl. 33-199.00R.
Rongved, Leif: *See*—
Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., 4,213,698, Cl. 355-77.000.
Rose, David; Weinrich, Erwin; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Oxidation hair dyes based upon tetraaminopyrimidine developers and couplers therefor. 4,213,758, Cl. 8-409.000.
Rose, John F.: *See*—
Wolford, Byron F.; and Rose, John F., 4,214,133, Cl. 200-31.00R.
Rose, Joseph L., to Krautkramer-Branson, Incorporated. Method and apparatus for providing dynamic focussing and beam steering in an ultrasonic apparatus. 4,213,344, Cl. 73-620.000.
Rose, Stanley E., to Ceram-Dent, Inc. Investment casting method. 4,213,495, Cl. 164-34.000.
Rosenfarb, Joseph: *See*—
Laitinen, Herbert A.; and Rosenfarb, Joseph, 4,214,017, Cl. 427-92.000.
Rosinger, Herbert P.: *See*—
Davies, John H.; Grayson, Basil T.; and Rosinger, Herbert P., 4,213,916, Cl. 260-465.00D.
Rosnowski, Wojciech, to RCA Corporation. Method of fabricating semiconductor devices. 4,213,807, Cl. 148-187.000.
Ross, Gerald F.: *See*—
Cronson, Harry M.; Lamensdorf, David; and Ross, Gerald F., 4,214,248, Cl. 343-756.000.
Ross, Roger J., to Singer Company, The. Needle bar support. 4,213,409, Cl. 112-158.00R.
Rossi, Alberto: *See*—
Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, 4,213,980, Cl. 424-246.000.
Rossi, Guglielmo; and Bosing, Hans, to Ranco Incorporated. Electrical switches for control devices such as temperature regulators. 4,214,136, Cl. 200-67.0DA.
Rossollin, Jean-Claude, to United Patents Trust Reg.-U.P.T. Method and apparatus for removing waste pieces from a pre-cut sheet. 4,213,378, Cl. 93-36.00A.
Roth, Manfred; and Dreier, Juergen, to Roth Werke GmbH. Solar collector. 4,213,449, Cl. 126-447.000.
Roth Werke GmbH: *See*—
Roth, Manfred; and Dreier, Juergen, 4,213,449, Cl. 126-447.000.
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, to United States of America, Army. Method of treating a permanent magnet alloy. 4,213,802, Cl. 148-101.000.
Rottwinkel, Leo: *See*—
Pfeiffer, Ferdinand; and Rottwinkel, Leo, 4,213,501, Cl. 169-46.000.
Rotzoll, Rudi-Heinz: *See*—
Eckell, Albrecht; Matthies, Paul; Pilz, Georg; and Rotzoll, Rudi-Heinz, 4,213,884, Cl. 260-29.20N.
Rousseau, George L.: *See*—
Synder, Richard C.; Sims, Roger D.; and Rousseau, George L., 4,213,400, Cl. 105-199.00C.
Roussel Uclaf: *See*—
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,213,989, Cl. 424-263.000.
Rowlinson, James S. Steering shaft and flange and method of making same. 4,213,351, Cl. 74-492.000.
Rozic, Krsto-Marijan: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; and Basler, Gunter, 4,213,552, Cl. 226-170.000.
Rubenstein, Raymond D.; and Rescorla, Charles L., to International Harvester Company. Constant flow hydraulic system. 4,213,511, Cl. 180-139.000.
Ruble, Eulalia B., executrix: *See*—
Ruble, Theodore A., deceased, 4,213,939, Cl. 422-151.000.
Ruble, Theodore A., deceased (by Ruble, Eulalia B., executrix), to Sid Richardson Carbon & Gasoline Co. Double venturi carbon black reactor system. 4,213,939, Cl. 422-151.000.
Ruettiger, Wilhelm: *See*—
Kretschmer, Alfred; Ruettiger, Wilhelm; and Wuerz, Albrecht, 4,213,217, Cl. 8-151.000.
Ruff, Robert O., to American Standard Inc. Blank filler plate for lock edge cut-out. 4,213,317, Cl. 70-450.000.
Ruhl, Edward A., to USM Corporation. One-piece hinged guard. 4,213,645, Cl. 293-145.000.
Rummele, John E.: *See*—
Bemis, Richard A.; and Rummele, John E., 4,213,211, Cl. 4-239.000.
Ruske, Manfred; and Elser, Wolfgang, to BASF Aktiengesellschaft. Aqueous dye formulations for cellulose or cellulose-containing fibers. 4,213,757, Cl. 8-518.000.
Rzeszewski, Theodore S.; and Frantzis, Paul D., to Matsushita Electric Corporation. Frequency synthesizer tuning system with variable dwell signal seek. 4,214,274, Cl. 358-193.100.
S.A.E.S. Getters S.p.A.: *See*—
Porta, Paolo D.; and Rabusin, Elio, 4,214,184, Cl. 313-481.000.
S.I.L.E.C.-Division Signalisation Industrielle: *See*—
Oules, Michel L., 4,214,127, Cl. 179-2.00R.
Sacco, Bruno; Dalheimer, Walter; and Schwarz, Friedrich, to Daimler-Benz Aktiengesellschaft. Installation for changing the position of an upper fastening or deflection point of a safety belt. 4,213,638, Cl. 280-808.000.
Safrit, Sam C.; Cassidy, Edward L., Sr.; Cothran, William B.; and Farrell, Roscoe M., to Alamance Industries, Inc. Panty hose with stretch-cotton panty. 4,213,312, Cl. 66-177.000.
Sagami Chemical Research Center: *See*—
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,214,097, Cl. 560-213.000.
Sahlin, Hans O. Device for a portable power saw. 4,213,364, Cl. 83-471.300.
Saini, Gurbachan S.: *See*—
Dickson, Vernon E.; Lee, James G. C.; and Saini, Gurbachan S., 4,214,207, Cl. 455-95.000.
Saito, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Electronic tuning circuit having image trapping element. 4,214,217, Cl. 334-45.000.
Saito, Mitsuo; Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Impedance matched tuning device having image trapping circuit. 4,214,218, Cl. 334-45.000.
Saito, Yoshihisa: *See*—
Kamiya, Takashi; and Saito, Yoshihisa, 4,214,094, Cl. 560-42.000.
Sakamoto, Kiyoshi; Tsukakoshi, Yukio; and Oie, Naoyuki, to Sanyo Electric Co., Ltd. Projector. 4,213,679, Cl. 353-72.000.
Sakata, Masazumi: *See*—
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.
Sakurai, Yojiro: *See*—
Fujii, Setsuro; Sakurai, Yojiro; Nakayama, Toyoo; and Matsui, Ryoji, 4,214,093, Cl. 560-34.000.
Salger, Werner, to Lumoprint Zindler KG (GmbH & Co.). Assembly for sealing lead-in areas in a developer station. 4,213,617, Cl. 277-12.000.
Sallmann, Alfred: *See*—
Habicht, Ernst; Ferrini, Pier G.; and Sallmann, Alfred, 4,213,993, Cl. 424-273.00B.
Samour, Carlos M.; Jackson, Earl G.; Thomas, Samuel J.; and Davidson, Louie E., to Kendall Company, The. Coated pipe and process for making same. 4,213,486, Cl. 138-143.000.
Samuelsen, Eirik: *See*—
Aanonsen, Bent; Odberg, Paul-Johny; and Samuelsen, Eirik, 4,213,712, Cl. 366-178.000.
Sandborn, Edmund B., to Novaro Investments Limited. Modular unit for the construction of floating decks of liquid storage tanks. 4,213,280, Cl. 52-309.900.
Sanders, Ralph K., to General Dynamics Corporation Pomona Division. Pallet transport system. 4,213,624, Cl. 280-43.120.
Sanders, Virgil E., to Litton Systems, Inc. Four mode Zeeman laser gyroscope with minimum hole burning competition. 4,213,705, Cl. 356-350.000.
Sandoz Ltd.: *See*—
Entschel, Roland; Mueller, Curt; and Steinemann, Willy, 4,213,898, Cl. 260-156.000.
Moser, Helmut; and von Tobel, Hans R., 4,213,897, Cl. 260-154.000.
Sangamo Company Limited: *See*—
Dickson, Vernon E.; Lee, James G. C.; and Saini, Gurbachan S., 4,214,207, Cl. 455-95.000.
Sangamo Weston, Inc.: *See*—
Mussatt, Thomas J., 4,214,284, Cl. 360-72.100.
Sanguu, Isao: *See*—
Mitani, Akira; and Sanguu, Isao, 4,213,583, Cl. 242-186.000.
Sankyo Company Limited: *See*—
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Sansone, Ronald P.: *See*—
Check, Frank T., Jr.; and Sansone, Ronald P., 4,214,157, Cl. 250-236.000.

Santora, Norman J.: *See*—
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,214,003, Cl. 424-301.000.

Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Kiyoshi; Tsukakoshi, Yukio; and Oie, Naoyuki, 4,213,679, Cl. 353-72.000.

Sardo, Alberto, to Xeda International S.A. Automatic machine for in particular calibrating fruit and vegetables. 4,213,533, Cl. 209-654.000.

Sarna, Abraham; and Sarna, David. Artists' portfolio. 4,213,520, Cl. 190-16.000.

Sarna, David: *See*—
Sarna, Abraham; and Sarna, David, 4,213,520, Cl. 190-16.000.

Sarnecki, Wilhelm: *See*—
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.

Sasaki, Hiroshi: *See*—
Oishi, Hideo; Noto, Takao; Nawata, Yoshiharu; Okazaki, Hiroshi; Sasaki, Hiroshi; Ando, Kunio; and Ogawa, Haruki, 4,214,091, Cl. 549-62.000.

Sasaki, Takehiko; and Yashiro, Yuji, to Sharp Kabushiki Kaisha. Electronic type music learning aids. 4,213,372, Cl. 84-470.00R.

Sato, Hideaki, to Canon Kabushiki Kaisha. Light beam scanning apparatus. 4,214,154, Cl. 250-201.000.

Sato, Hideo; and Shimamune, Takayuki, to Permelec Electrode Ltd. Electrolysis electrodes and method of making same. 4,213,843, Cl. 204-290.00F.

Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Tape recorder with means for displaying operation modes in the form of characters. 4,214,281, Cl. 360-61.000.

Sato, Masanobu; and Furuta, Kenzi, to Olympus Optical Co., Ltd. Tape recorder. 4,214,282, Cl. 360-69.000.

Sato, Masato; and Inoue, Takemi, to Kawasaki Jukogyo Kabushiki Kaisha. Engine exhaust means for motor propelled boats. 4,213,414, Cl. 115-73.000.

Sato, Nobuhiro. Optical assembly for detecting an abnormality of an organ or tissue and method. 4,213,462, Cl. 128-634.000.

Sato, Setsuo: *See*—
Fujita, Hisaya; Ando, Hiroshi; and Sato, Setsuo, 4,214,250, Cl. 346-145.000.

Sato, Tadashi, to Canon Kabushiki Kaisha. Automatic original handling device. 4,213,604, Cl. 271-233.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Ink supply device for hand labeler. 4,213,389, Cl. 101-295.000.

Sato, Yoshio: *See*—
Kurihara, Nobuo; Sato, Yoshio; Kawano, Shigeyoshi; Iioka, Michihiro; Iba, Daizo; and Kurihara, Tadashi, 4,214,301, Cl. 364-119.000.

Satoh, Ken: *See*—
Sato, Masanobu; Satoh, Ken; Nakao, Toshihiro; and Furuta, Kenzi, 4,214,281, Cl. 360-61.000.

Sattlegger, Hans: *See*—
Moretto, Hans-Heinrich; Steinberger, Helmut; Larking, Ingrid; and Sattlegger, Hans, 4,214,066, Cl. 528-28.000.

Sauer, Warren A.: *See*—
Geren, Keith E.; Sauer, Warren A.; and Young, Donald A., 4,214,313, Cl. 367-1.000.

Saunders, Thomas E.: *See*—
Firtion, Victor A.; Herriott, Donald R.; Poulsen, Martin E.; Rongved, Leif; and Saunders, Thomas E., 4,213,698, Cl. 355-77.000.

Sawabe, Takeshi: *See*—
Miyashita, Toshio; Fujii, Yoshizo; and Sawabe, Takeshi, 4,213,524, Cl. 194-2.000.

Sawicki, Frank S.: *See*—
Nubani, Jawdat I.; and Sawicki, Frank S., 4,213,663, Cl. 316-24.000.

Sawyer, Thomas F., to General Electric Company. Method for casting directionally solidified articles. 4,213,497, Cl. 164-60.000.

Saxholm, Rolf. Apparatus for testing reactions. 4,213,825, Cl. 435-291.000.

Saxton, Arthur L., to Exxon Research & Engineering Co. Fluid coking and gasification process. 4,213,848, Cl. 208-127.000.

Schaaf, Ernest M.: *See*—
Peabody, William A.; and Schaaf, Ernest M., 4,213,306, Cl. 62-85.000.

Schaaf, Thomas K.: *See*—
Corey, Elias J.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,214,099, Cl. 560-256.000.

Schaberg, Frank: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Schaefer, John W. Engine emission pollutant separator. 4,213,770, Cl. 55-269.000.

Schairer, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Radiation-emitting semiconductor diode. 4,214,251, Cl. 357-17.000.

Schane, Harry P., Jr.; Harding, Homer R.; and Creange, John E., to Sterling Drug Inc. Pituitary-adrenal inhibiting method. 4,213,977, Cl. 424-241.000.

Scharer, Hans R.: *See*—
Hold, Peter; Tadmor, Zehev; and Scharer, Hans R., 4,213,710, Cl. 366-81.000.

Schefer, Kurt; and Fluck, Jakob, to Reiter Machine Works, Ltd. Air coupling. 4,213,573, Cl. 242-18.00A.

Schepers, Georg: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Scheppele, Lyle W., to Toledo Stamping & Manufacturing Company. Feed delivery apparatus. 4,213,525, Cl. 198-364.000.

Schilling, Wilfried: *See*—
Kicherer, Robert; and Schilling, Wilfried, 4,214,151, Cl. 219-492.000.

Schimanski, Georg, to Globol-Werk GmbH. Electrically heated vaporizer device for dispensing a thermally volatilizable substance. 4,214,146, Cl. 219-274.000.

Schloemann-Siemag Aktiengesellschaft: *See*—
Priebe, Fritz, 4,213,318, Cl. 72-21.000.

Schmelter, Herbert: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Schmelzer Corporation: *See*—
Benjamin, Benjamin C., 4,213,481, Cl. 137-596.180.

Schmeykal, Rudolf: *See*—
Haftmann, Johannes; and Schmeykal, Rudolf, 4,213,715, Cl. 400-196.100.

Schmidt, Gunther; and Leitold, Matyas, to Boehringer Ingelheim GmbH. 11-(Piperazino-acetyl)-5,11-dihydro-6H-pyrido[2,3-b][1,4]benzodiazepin-6-ones and salts thereof. 4,213,984, Cl. 424-250.000.

Schmidt, Gunther; and Leitold, Matyas, to Boehringer Ingelheim GmbH. Novel 5,11-dihydro-6H-pyrido-[2,3-b][1,4]-benzodiazepine-6-ones. 4,213,985, Cl. 424-250.000.

Schmidt, Robert W., to Texas Instruments Incorporated. Eight bit standard connector bus for sixteen bit microcomputer. 4,214,302, Cl. 364-200.000.

Schmidt, Thomas W., to Phillips Petroleum Company. Determination of infinite dilution activity coefficients ($\gamma\infty$) using molecular beams. 4,214,158, Cl. 250-281.000.

Schneider, Dennis M.: *See*—
Bazin, Lucas J.; Peterson, Gary R.; and Schneider, Dennis M., 4,214,261, Cl. 358-19.000.

Schneider, Franklin R., to Dynamote Corporation. Electrical power unit. 4,214,198, Cl. 320-15.000.

Schneider, Fred A. Rotary, hand-held apparatus for performing various soil working operations. 4,213,504, Cl. 172-25.000.

Schnieder, Erich: *See*—
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.

Schoettle, Klaus; Dobler, Peter; Lewin, Helmut; and Koester, Eberhard, to BASF Aktiengesellschaft. Cleaning apparatus for a web of plastics film having a magnetic coating. 4,213,222, Cl. 15-100.000.

Schonhagen, Hubert: *See*—
Muders, Rolf; Leister, Heinrich; Dittmer, Helmut; and Schonhagen, Hubert, 4,213,910, Cl. 260-371.000.

Schreurs, Gerardus C. M.; Raudenbusch, Werner T.; and Visser, Theodorus N., to Shell Oil Company. Esters containing phenolic groups as epoxy resin curing agents. 4,214,068, Cl. 528-98.000.

Schuco Heinz Schurmann GmbH & Co.: *See*—
Diels, Manfred; Dienstuhl, Karl W.; Jager, Tilo; and Hocker, Eitel, 4,213,236, Cl. 29-243.500.

Schumacher, Egon: *See*—
Nagel, Hans J.; and Schumacher, Egon, 4,213,422, Cl. 119-21.000.

Schurter, Rolf; Rempfler, Hermann; and Bohner, Beat, to Ciba-Geigy Corporation. Pyridyloxy-phenoxy-α-propionic acid aminoalkyl esters. 4,213,774, Cl. 71-94.000.

Schwarz, Frederick M., to United Technologies Corporation. Seal clearance control system for a gas turbine. 4,213,296, Cl. 60-39.14R.

Schwarz, Friedrich: *See*—
Sacco, Bruno; Dalheimer, Walter; and Schwarz, Friedrich, 4,213,638, Cl. 280-808.000.

Schweickart, Albert J.; and Mooney, Thomas F., III, to BASF Wyandotte Corporation. Device for measuring flow of weak cell liquor. 4,213,336, Cl. 73-215.000.

Schwerdtel, Wulf: *See*—
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,214,105, Cl. 568-771.000.

Sciaky Intertechnique, S.A.: *See*—
Sciaky, Mario M., 4,213,554, Cl. 228-2.000.

Sciaky, Mario M., to Sciaky Intertechnique, S.A. Friction welding machine. 4,213,554, Cl. 228-2.000.

Scott, Dale K.: *See*—
Calvert, Rodney K.; Scott, Dale K.; and Fishback, Alton J., 4,213,283, Cl. 53-48.000.

Scott, Gerald. Process for preparing oxidatively-stable polymers by reaction with antioxidant in the presence of free radical. 4,213,892, Cl. 260-45.95C.

Scott, L. J.: *See*—
Kreutz, George D.; Scott, L. J.; and Kelly, James P., 4,213,528, Cl. 206-205.000.

Scourtes, Chris N., to Aqua Star Pool Company. Air channel device. 4,213,210, Cl. 4-543.000.

SCP Producer's Services Limited: *See*—
Hunt, Brian K.; and O'Donnell, Leopold H., 4,214,278, Cl. 360-14.000.

Scrivo, Jerry V.; and Maloney, John V., to McCord Corporation. Energy-absorbing bumper assembly. 4,213,644, Cl. 293-117.000.

See, Gary G., to Telxon Corporation. Interlock for power sources in data processing apparatus. 4,214,172, Cl. 307-150.000.

Seefried, Carl G., Jr.; Armstrong, George H.; and Van Cleve, Russell, to Union Carbide Corporation. High resilience flame-retardant polyurethane foams based on polymer/polyol compositions. 4,214,055, Cl. 521-137.000.

Seeliger, Christian: *See*—
Bromer, Gunter; Gose, Horst; Hoffmann, Klaus-Rudiger; and Seeliger, Christian, 4,214,192, Cl. 318-573.000.

Seiden, Paul: *See*—
McCarty, Charles B.; and Seiden, Paul, 4,214,038, Cl. 428-411.000.

Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the hydroxylation of phenol. 4,214,105, Cl. 568-771.000.

Seigi Komatsu: *See*—
Komatsu, Seigi; and Kitajima, Hiroshi, 4,213,228, Cl. 17-11.000.

Seiko Koko Kabushiki Kaisha: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,214,134, Cl. 200-37.00R.

Seitzer, Walter H., to Suntech, Inc. Coal drying process. 4,213,752, Cl. 432-14.000.

Sekioka, Hakobu: *See*—
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kiyono, Hiroshi; Ishimoto, Akio; Noda, Yoichiro; and Yada, Kozo, 4,213,925, Cl. 264-22.000.
Kodera, Yoshiaki; Watanabe, Kiyoyuki; Kadoya, Tetsuo; and Taguchi, Tadashi, 4,214,034, Cl. 428-315.000.

Sele, Alex; Ferrini, Pier G.; Haas, Georges; Jaeggi, Knut A.; and Rossi, Alberto, to Ciba-Geigy Corporation. Azathianaphthalenes. 4,213,980, Cl. 424-246.000.

Sell, Sanford S. Drink container holder. 4,213,649, Cl. 297-189.000.

Semashko, Andrei P.; Gimaev, Nasikh Z.; Maximov, Ivan V.; Bezrukov, Sergei V.; and Rabinovich, Vladimir B. Electrochemical working method and system for effecting same. 4,213,834, Cl. 204-129.250.

Sempliner, Arthur T.: *See*—
Burian, Paul D.; and Sempliner, Arthur T., 4,213,471, Cl. 132-73.600.

Senet, Jean-Pierre G.: *See*—
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,214,073, Cl. 528-369.000.

Sengstock, Paul J., Jr.; and Dutcher, Gerald L., to Hughes Aircraft Company. Spin activated safety circuit for spacecraft. 4,213,586, Cl. 244-158.000.

Sensabaugh, Paul F.: *See*—
Mann, Friedrich H.; and Sensabaugh, Paul F., 4,214,197, Cl. 320-2.000.

Setzer, William C.: *See*—
Fister, Julius C., Jr.; Setzer, William C.; and Cox, Leon, 4,214,041, Cl. 428-607.000.

Sevcon Limited: *See*—
Sloan, Albert E., 4,214,290, Cl. 361-154.000.

Severijns, Adrianus P.; and Staas, Frans A., to U.S. Philips Corporation. Superleak. 4,213,311, Cl. 62-514.00R.

Shaffer, Detmer B., to Sparkle Wash, Inc. Mobile cleaning unit. 4,213,796, Cl. 134-26.000.

Shah, Mahendra: *See*—
Goldberg, Bruce S.; and Shah, Mahendra, 4,213,815, Cl. 156-244.110.

Shannon, Joseph W., to McNeil Corporation. Reservoir sensor. 4,213,339, Cl. 73-304.00R.

Shapiro, Stanley: *See*—
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,800, Cl. 148-2.000.
Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,799, Cl. 148-2.000.

Sharar, Stephen T. Heat transfer lens steam turbine. 4,213,299, Cl. 60-676.000.

Sharp Kabushiki Kaisha: *See*—
Sasaki, Takehiko; and Yashiro, Yuji, 4,213,372, Cl. 84-470.00R.

Shaw, Nathan O., to All American Products Company, Inc. Tool guide bushing mounting assembly. 4,213,658, Cl. 308-15.000.

Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., to Motorola, Inc. Serial-parallel analog-to-digital converter using voltage subtraction. 4,214,232, Cl. 340-347.0AD.

Shaw, Pern; Musa, Fuad H.; and Kreinick, Stephen J., to Motorola Inc. Serial parallel analog-to-digital converter using voltage level shifting of a minimum reference voltage. 4,214,233, Cl. 340-347.0AD.

Shell Internationale Research Maatschappij B.V.: *See*—
Davies, John H.; Grayson, Basil T.; and Rosinger, Herbert P., 4,213,916, Cl. 260-465.00D.

Shell Oil Company: *See*—
de Jong, Aaldert J.; and Heijmen, Hendricus J., 4,214,098, Cl. 560-231.000.
Schreurs, Gerardus C. M.; Raudenbusch, Werner T.; and Visser, Theodorus N., 4,214,068, Cl. 528-98.000.
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,998, Cl. 424-285.000.
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., 4,213,999, Cl. 424-285.000.

Sheppard, William L., to AVM Corporation. Butterfly valve. 4,213,595, Cl. 251-308.000.

Sher, Arden. Radiant energy to electric energy converter. 4,213,797, Cl. 136-89.0SP.

Sherri Cup, Inc.: *See*—
Caccavale, Patrick W., 4,213,537, Cl. 220-215.000.

Shigehara, Masamichi: *See*—
Otsuka, Kei; Shigehara, Masamichi; and Yokokawa, Sumio, 4,214,289, Cl. 361-20.000.

Shim, Norm, to Baxter Travenol Laboratories, Inc. Control system for metering apparatus for a fluid infusion system. 4,213,454, Cl. 128-214.00E.

Shimamune, Takayuki: *See*—
Sato, Hideo; and Shimamune, Takayuki, 4,213,843, Cl. 204-290.00F.

Shimizu, Tsuguo; and Matsuura, Tsuguo, to Hitachi, Ltd. Multiprogrammed data processing system with improved interlock control. 4,214,304, Cl. 364-200.000.

Shinko Automatic Device Co., Ltd.: *See*—
Miyashita, Toshio; Fujii, Yoshizo; and Sawabe, Takeshi, 4,213,524, Cl. 194-2.000.

Shinoda, Kenzo: *See*—
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,214,016, Cl. 427-54.100.

Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Chimura, Kozo; and Shinozaki, Nobuo, 4,214,134, Cl. 200-37.00R.

Shipchandler, Mohammed T., to International Minerals & Chemical Corporation. Phthalimide compounds and method for treating disorders of the heart. 4,213,996, Cl. 424-274.000.

Shippert, Ronald D., to Denver Splint Company, The. Compound splint and kit. 4,213,452, Cl. 128-89.00R.

Shirley, Arthur R., Jr., to Tennessee Valley Authority. Granulation and coating by improved method of heat removal. 4,213,924, Cl. 264-7.000.

Shop-Vac Corporation: *See*—
Miller, Jonathan, 4,213,224, Cl. 15-344.000.

Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., to Congoleum Corporation. Resinous polymer sheet materials having surface decorative effects and methods of making the same. 4,214,028, Cl. 428-159.000.

Shreve, James S., to United States of America, Army. Phase measuring device. 4,213,697, Cl. 356-351.000.

Sid Richardson Carbon & Gasoline Co.: *See*—
Ruble, Theodore A., deceased, 4,213,939, Cl. 422-151.000.

Sidorenko, Valery A.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.

Siegfried Aktiengesellschaft: *See*—
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, 4,214,095, Cl. 560-57.000.

Siemens Aktiengesellschaft: *See*—
Aulich, Hubert; Douklias, Nikolaos; Hacker, Heinz; and Zeidler, Guenter, 4,213,672, Cl. 350-96.230.
Baier, Walter P.; and Grammueller, Harald, 4,214,209, Cl. 375-1.000.
Bromer, Gunter; Gose, Horst; Hoffmann, Klaus-Rudiger; and Seeliger, Christian, 4,214,192, Cl. 318-573.000.
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.
Eggert, Hans-Joachim; Zenkert, Heinrich; Kuehne, Rudi; and Oberberger, Otto, 4,213,532, Cl. 206-504.000.
Fickelscher, Horst, 4,213,835, Cl. 204-129.250.
Heynisch, Hinrich; and Krueger, Hans, 4,213,810, Cl. 156-73.100.
Meyer, Fritz, 4,214,235, Cl. 340-347.0DA.
Renheim, Gunnar, 4,213,465, Cl. 128-731.000.
Windele, Josef, 4,213,551, Cl. 226-74.000.
Zerbst, Manfred, 4,213,940, Cl. 422-246.000.

Sierdzinski, Michael S.: *See*—
Zvanut, Albert J.; and Sierdzinski, Michael S., 4,214,145, Cl. 219-145.220.

Sigl, Wayne C.; and LaBorde, Philip A., to Kimberly-Clark Corporation. Disposable diaper with localized area of increased density. 4,213,459, Cl. 128-287.000.

Signetics Corporation: *See*—
Lemons, Kyle E.; Blish, Richard C., II; and Reimer, Jan D., 4,213,818, Cl. 156-643.000.

Sikdar, Subhas K.; and Moore, James H., to Occidental Research Corporation. Recovery of hydrofluoric acid from fluosilicic acid with high pH hydrolysis. 4,213,951, Cl. 423-339.000.

Sikdar, Subhas K., to Occidental Research Corporation. Recovery of hydrofluoric acid from fluosilicic acid with high pH hydrolysis. 4,213,952, Cl. 423-339.000.

Sikes, Gail T.: *See*—
Harris, Robert J.; and Sikes, Gail T., 4,213,530, Cl. 206-447.000.

Silverman, John H.; and Cahill, James P., to Precise Metal Parts Company. Automatic bagging apparatus. 4,213,284, Cl. 53-74.000.

Simko, Aladar O., to Ford Motor Company. Air/fuel ratio regulator. 4,213,435, Cl. 123-446.000.

Simmons Fastener Corporation: *See*—
Hoen, Cuyler, 4,213,230, Cl. 24-217.00R.

Simone, A. A.: *See*—
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,213,862, Cl. 210-83.000.

Sims, Roger D.: *See—*
Synder, Richard C.; Sims, Roger D.; and Rousseau, George L., 4,213,400, Cl. 105-199.00C.
Singer Company, The: *See—*
Burns, Richard H.; and Crabtree, Kenneth, 4,213,704, Cl. 356-349.000.
Hoffman, Jay, 4,213,343, Cl. 73-505.000.
Johnson, Ralph E., 4,213,410, Cl. 112-228.000.
Knowles, Warren D., 4,213,411, Cl. 112-240.000.
Ross, Roger J., 4,213,409, Cl. 112-158.00R.
Sullivan, John B.; and Marsh, David R., 4,213,252, Cl. 35-10.240.
Sitz, Claus, to Metallhuttenwerke Lubeck GmbH. Process for treating a mud produced during gas scrubbing in a blast furnace or a steelworks. 4,213,778, Cl. 75-25.000.
Sivers, Rolf: *See—*
Stotz, Erich; and Sivers, Rolf, 4,213,632, Cl. 280-697.000.
Skaife, Vivian A., Irrevocable Trust: *See—*
Skaife, William A., 4,213,274, Cl. 47-81.000.
Skaife, William A., to Skaife, Vivian A., Irrevocable Trust, Margaret R. Skaife, Trustee. Aerated continuously watered plant and seed organic growing medium and container for same. 4,213,274, Cl. 47-81.000.
Skatsche, Othmar: *See—*
Feichtinger, Gerhard; Skatsche, Othmar; and List, Hans, 4,213,439, Cl. 123-195.00S.
SKF Industrial Trading and Development Company B.V.: *See—*
Timmer, Hendrikus J. M., 4,213,225, Cl. 16-21.000.
SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; and Huber, Wolfgang, 4,213,656, Cl. 308-8.200.
Sloan, Albert E., to Sevcon Limited. Control circuit for electromagnetically operated contactor. 4,214,290, Cl. 361-154.000.
Sloan, Kenneth B.: *See—*
Bodor, Nicholas S.; and Sloan, Kenneth B., 4,213,978, Cl. 424-241.000.
Smakman, Robert; and van den Berg, Gerrit H., to Akzo N.V. Dialysis with ion exchange extraction of phosphates. 4,213,859, Cl. 210-27.000.
Small, Robert E.: *See—*
Helmer, Warren D.; and Small, Robert E., 4,213,229, Cl. 17-46.000.
Smit Ovens Nijmegen B.V.: *See—*
Wens, Johannes C., 4,213,754, Cl. 432-115.000.
Smith International, Inc.: *See—*
Tschirky, John E.; and Sullivan, Wayne M., 4,213,508, Cl. 175-235.000.
Smith, John R.: *See—*
Coster, Hans G. L.; Ashcroft, Robert G.; and Smith, John R., 4,214,203, Cl. 324-425.000.
Smith, Nancy O. Ski mitten. 4,213,205, Cl. 2-161.00A.
Smith, Ronald D.: *See—*
Fies, William J.; Smith, Ronald D.; Reeher, John R.; and Story, Michael S., 4,214,160, Cl. 250-292.000.
Snavely, Benjamin B.: *See—*
Hayward, John S.; Snavely, Benjamin B.; and Tschang, Pin S., 4,214,264, Cl. 358-44.000.
Societe Anonyme Automobiles Citroen: *See—*
Mauron, Gerard, 4,213,637, Cl. 280-802.000.
Societe Anonyme dite:EPARCO: *See—*
Bavaveas, Tristan, 4,213,871, Cl. 252-60.000.
s.a. Texaco Belgium n.v.: *See—*
Moore, Malcolm, 4,213,699, Cl. 356-70.000.
Societe d'Optique Precision Electronique et Mecanique Sopelem: *See—*
Leblanc, Michele, 4,213,700, Cl. 356-73.000.
Societe Nationale des Poudres et Explosifs: *See—*
Passagne, Claude G.; Senet, Jean-Pierre G.; Lippler, Remy R.; and Plazanet, Jacques, 4,214,073, Cl. 528-369.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Euler, August H. L.; and Beziac, Gilbert F. A., 4,213,739, Cl. 416-226.000.
SOGEMARIC, Societe de Gestion et de Marketing pour Industries de Consommation: *See—*
Denninger, Claude; and Moutton, Louis, 4,213,265, Cl. 43-84.000.
Sohma, Yukio: *See—*
Nara, Yasuhiro; Sohma, Yukio; and Hattori, Akira, 4,214,228, Cl. 371-40.000.
Someya, Teruo: *See—*
Namae, Takao; and Someya, Teruo, 4,214,163, Cl. 250-311.000.
Sonometrics Systems, Inc.: *See—*
Katz, Louis; and Weil, Kurt W., 4,213,464, Cl. 128-645.000.
Sood, Raman R.: *See—*
Dewing, Ernest W.; Huni, Jean-Paul R.; Sood, Raman R.; and Southam, Frederick W., 4,213,599, Cl. 266-166.000.
Sooter, Matthew C.; Becraft, Lloyd G.; and Kegler, William H., to Conoco, Inc. Delayed coking process with hydrotreated recycle. 4,213,846, Cl. 208-50.000.
Sotchenko, Vladimir P.: *See—*
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Bolesiav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.
Sotirianos, Konstantin: *See—*
Muller, Hans; and Sotirianos, Konstantin, 4,213,861, Cl. 210-82.000.
Southam, Frederick W.: *See—*
Dewing, Ernest W.; Huni, Jean-Paul R.; Sood, Raman R.; and Southam, Frederick W., 4,213,599, Cl. 266-166.000.
Sowter, Brian R.; and Warwick, William A., to International Business Machines Corporation. Convergence assembly for cathode ray tube. 4,214,221, Cl. 335-212.000.
Sparkle Wash, Inc.: *See—*
Shaffer, Detmer B., 4,213,796, Cl. 134-26.000.
Spaulding, David B., to Energy Alternatives, Inc. Solid refuse furnace. 4,213,404, Cl. 110-229.000.
Sperry Corporation: *See—*
Cronson, Harry M.; Lamensdorf, David; and Ross, Gerald F., 4,214,248, Cl. 343-756.000.
Deardorff, Duane R.; and Mann, William W., 4,213,571, Cl. 241-48.000.
Johnson, Gary R., 4,214,292, Cl. 361-386.000.
Spiegelberg, Gary R., to Erico Products, Inc. Stud welding apparatus and process. 4,214,144, Cl. 219-99.000.
Spiess, Frederick N.; Boegeman, Dwight E.; Pavlicek, Frank V.; and Lowenstein, Carl D., to University of California, Regents of the. Precision transponder and method of communicating therewith. 4,214,314, Cl. 367-2.000.
Spinale, Frank A.: *See—*
Hyland, Joseph F.; Hyland, Barbara B.; Fogarty, A. Edward; Fogarty, Bonnie R.; and Spinale, Frank A., 4,213,266, Cl. 46-1.00R.
Sprague Electric Company: *See—*
O'Shea, Martin W., 4,214,210, Cl. 455-282.000.
Sroub, Joseph W., to Production Experts, Inc. Glider. 4,213,650, Cl. 297-281.000.
Staas, Frans A.: *See—*
Severijns, Adrianus P.; and Staas, Frans A., 4,213,311, Cl. 62-514.00R.
Stahl-Urban Company: *See—*
Conner, William R., Jr., 4,213,547, Cl. 223-2.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; and Pichler, Ludwig, to Boehringer Ingelheim GmbH. 2-Phenylimino-imidazolidines and salts thereof. 4,213,995, Cl. 424-273.00R.
Standard Microsystems Corp.: *See—*
Popper, Jay, 4,214,173, Cl. 307-224.00C.
Standard Oil Company: *See—*
Dolhyj, Serge R.; Suresh, Dev D.; and Grasselli, Robert K., 4,213,917, Cl. 260-465.00D.
Standard Oil Co. (Indiana): *See—*
McCaulay, David A.; and Nevitt, Thomas D., 4,214,116, Cl. 585-747.000.
Standex International GmbH, Firma: *See—*
Werthmann, Wilfried, 4,213,819, Cl. 156-660.000.
Stanfield, George I.: *See—*
Goodman, David S.; and Stanfield, George I., 4,213,668, Cl. 339-217.00R.
Stanford, Louise A. Bread box dispenser. 4,213,540, Cl. 221-150.00R.
Stapp, Paul R., to Phillips Petroleum Company. Catalyst composition. 4,213,879, Cl. 252-429.00R.
Starbuck, Arthur E. Process for desulfurization of coal and ores. 4,213,793, Cl. 106-286.800.
Stauduhar, Richard P.: *See—*
Mozer, Forrest S.; and Stauduhar, Richard P., 4,214,125, Cl. 179-1.0SM.
Stauffer Chemical Company: *See—*
Chang, Pei K., 4,214,009, Cl. 426-558.000.
Corbett, Constance R., 4,214,010, Cl. 426-573.000.
Stead, Cecil V.: *See—*
Phillips, Duncan A. S.; Anderson, Brian; Jackson, Neville; Stead, Cecil V.; and Costello, Alan T., 4,213,899, Cl. 260-156.000.
Steck, Werner: *See—*
Brodt, Rudolf; Jakusch, Helmut; Koester, Eberhard; Loeser, Werner; Ohlinger, Manfred; Sarnecki, Wilhelm; and Steck, Werner, 4,213,959, Cl. 423-634.000.
Steele, Thomas L.: *See—*
Swisher, George W., Jr.; and Steele, Thomas L., 4,213,719, Cl. 404-84.000.
Steichen, Clemons P. Oxygen tank holding device for wheelchairs. 4,213,648, Cl. 297-188.000.
Steinberger, Helmut: *See—*
Moretto, Hans-Heinrich; Steinberger, Helmut; Larking, Ingrid; and Sattlegger, Hans, 4,214,066, Cl. 528-28.000.
Steinemann, Willy: *See—*
Entschel, Roland; Mueller, Curt; and Steinemann, Willy, 4,213,898, Cl. 260-156.000.
Steiner, Robert H.; Duncan, Gary L.; and Touhsaent, Robert E., to Mobil Oil Corporation. Polypropylene film with primer of a water dispersed epoxy resin coating. 4,214,039, Cl. 428-414.000.
Stekly, Zdenek J. J. Magnetic separating apparatus with magnetic shielding means. 4,213,854, Cl. 209-223.00R.
Stephan, Herbert, to Leybold-Heraeus GmbH. Method of coating metal substrates with alloys at elevated substrate temperatures. 4,214,015, Cl. 427-42.000.
Sterling Drug Inc.: *See—*
Clarke, Robert L.; and Daum, Sol J., 4,214,084, Cl. 546-72.000.
Lewis, Thomas R.; and Michne, William F., 4,214,085, Cl. 546-97.000.
Schane, Harry P., Jr.; Harding, Homer R.; and Creange, John E., 4,213,977, Cl. 424-241.000.
Sterling, Henley F.; Bush, Eric L.; and McManus, Stephen J., to International Standard Electric Corporation. Electrolytic capacitors. 4,214,293, Cl. 361-433.000.
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, to BASF Aktiengesellschaft. Process for the manufacture of linear high molecular weight polyesters. 4,214,072, Cl. 528-272.000.

Stevens, Daniel M. Collapsible and adjustable gage apparatus. 4,213,246, Cl. 33-178.00F.

Stolyar, Genrikh L.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.

Stoody Company: *See*—
Zvanut, Albert J.; and Sierdzinski, Michael S., 4,214,145, Cl. 219-145.220.

Stookey, Gary K.; and Jackson, James F. Stove door operator. 4,213,446, Cl. 126-192.000.

Storey, Clyde H.: *See*—
Lemker, Richard S.; and Storey, Clyde H., 4,213,772, Cl. 65-30.00R.

Story, Michael S.: *See*—
Fies, William J.; Smith, Ronald D.; Reeher, John R.; and Story, Michael S., 4,214,160, Cl. 250-292.000.

Stotko, Norbert A.: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.

Stotz, Erich; and Sivers, Rolf, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Rear axle suspension. 4,213,632, Cl. 280-697.000.

Straffi, Franco, to Breda Termomeccanica S.p.A. Supporting grate for tube plates and relative assembling in a steam generator or the like. 4,213,499, Cl. 165-162.000.

Stritzl, Karl: *See*—
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,213,630, Cl. 280-634.000.

Stromsta, Roger R.; Nathanson, Marshall R.; and Morton, Dennis S., to Burroughs Corporation. Novel TSF head pair for dual recording on flexible disks. 4,214,287, Cl. 360-103.000.

Strube, Herbert E., to Procter & Gamble Company, The. Fiber-reinforced, activated, zeolite molecular sieve tablets and carbonation of aqueous beverages therewith. 4,214,011, Cl. 426-591.000.

Strunc, Gerald R., to Pako Corporation. Management data system for print sorter. 4,214,310, Cl. 364-475.000.

Strybel, Richard V., to Gould Inc. Service tool. 4,213,216, Cl. 7-170.000.

Stulen, Foster B., to Harvard College, President and Fellows. Monitoring myoelectric signals. 4,213,466, Cl. 128-733.000.

Stulen, Foster B.; and De Luca, Carlo, to Harvard College, President and Fellows. Monitoring myoelectric signals. 4,213,467, Cl. 128-733.000.

Stumpp, Gerhard: *See*—
Vogtmann, Hans-Jorg; and Stumpp, Gerhard, 4,213,434, Cl. 123-462.000.

Sudo, Yoichi: *See*—
Hoshino, Tadayoshi; and Sudo, Yoichi, 4,213,634, Cl. 280-728.000.

Sugimoto, Kenji: *See*—
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, 4,213,926, Cl. 264-74.000.

Sugimoto, Shigetoki; Ishikawa, Ro; and Matsushita, Shigeo, to Nippon Selfoc Company, Limited. Light coupling and branching device using light focusing transmission body. 4,213,677, Cl. 350-96.180.

Sugiura, Muneharu; Minami, Setsuo; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Copying apparatus having a high-speed copying optical system. 4,213,690, Cl. 355-8.000.

Sulewsky, James E., to American Seating Company. Acoustical wall panel. 4,213,516, Cl. 181-286.000.

Sullivan, John B.; and Marsh, David R., to Singer Company, The. Repeating pattern simulation of a polygon face object system. 4,213,252, Cl. 35-10.240.

Sullivan, Wayne M.: *See*—
Tschirky, John E.; and Sullivan, Wayne M., 4,213,508, Cl. 175-235.000.

Sulzer Brothers Limited: *See*—
Mandrin, Charles, 4,213,953, Cl. 423-359.000.

Sumitomo Aluminum Smelting Company, Ltd.: *See*—
Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, 4,213,558, Cl. 228-176.000.

Sumitomo Chemical Company, Limited: *See*—
Kanazawa, Hiroyuki, 4,214,064, Cl. 526-193.000.

Sumitomo Metal Industries, Ltd.: *See*—
Nakashima, Koichi; Nagaoka, Kiyosi; and Hikosaka, Toshihisa, 4,214,311, Cl. 364-482.000.

Sunbeam Plastics Corporation: *See*—
Montgomery, Gary V., 4,213,534, Cl. 215-216.000.

Sung, Rodney L.: *See*—
Larkin, John M.; Cullen, William P.; Sung, Rodney L.; and Zoleski, Benjamin H., 4,214,083, Cl. 544-277.000.

Suntech, Inc.: *See*—
Seitzer, Walter H., 4,213,752, Cl. 432-14.000.

Surber, Oliver M.: *See*—
Blake, Larry V.; Womeldorph, Donald E., Jr.; Surber, Oliver M.; and James, John P., 4,213,856, Cl. 209-250.000.

Surber, William A.: *See*—
Jones, Clifford M.; and Surber, William A., 4,213,714, Cl. 400-124.000.

Suresh, Dev D.: *See*—
Dolhyj, Serge R.; Suresh, Dev D.; and Grasselli, Robert K., 4,213,917, Cl. 260-465.00D.

Suzuki, Tadashi: *See*—
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, 4,213,596, Cl. 254-134.30R.

Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, to TMC Corporation. Spring locking device. 4,213,630, Cl. 280-634.000.

Svoboda, Josef: *See*—
Krob, Erwin; and Svoboda, Josef, 4,213,629, Cl. 280-605.000.

Swank, Harry R.: *See*—
Crosby, Alton L.; and Swank, Harry R., 4,214,142, Cl. 219-86.250.

Swanson, Arthur P. Grip bumper. 4,213,609, Cl. 273-75.000.

Swartwout, Robert L. Appalachian dulcimer lapboard. 4,213,369, Cl. 84-284.000.

Swenson, Rudolph E. Tongue blade for mouth gag for adults. 4,213,451, Cl. 128-12.000.

Swisher, George W., Jr.; and Steele, Thomas L., to CMI Corporation. Grade averaging apparatus. 4,213,719, Cl. 404-84.000.

Swiss Aluminium Ltd.: *See*—
Fister, Julius C., Jr.; Setzer, William C.; and Cox, Leon, 4,214,041, Cl. 428-607.000.
Mayo, William E.; Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,800, Cl. 148-2.000.
Raghavan, Mathur; Shapiro, Stanley; Hardy, Ronald G.; and Block, Duncan G., 4,213,799, Cl. 148-2.000.

Swodenk, Wolfgang: *See*—
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,214,105, Cl. 568-771.000.

Synder, Richard C.; Sims, Roger D.; and Rousseau, George L., to Pullman Incorporated. Resilient railway body center plate. 4,213,400, Cl. 105-199.00C.

Syntex (U.S.A.) Inc.: *See*—
Walker, Keith A. M., 4,213,991, Cl. 424-273.00R.

Szabo, Georges: *See*—
Engelhard, Philippe; Legendre, Michel; Paris, Guy; and Szabo, Georges, 4,213,849, Cl. 208-139.000.

Szpakowski, Robert J.: *See*—
Thompson, Leo M.; Colt, John Z.; and Szpakowski, Robert J., 4,213,545, Cl. 222-386.500.

Tabara, Noboru: *See*—
Fushimi, Akihiro; Tabara, Noboru; and Isaki, Mikio, 4,214,283, Cl. 360-71.000.

Tachino, Tomio: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,213,535, Cl. 220-20.500.

Tadanier, John S.; and Martin, Jerry R., to Abbott Laboratories. 6'-Epifortimicin A and B derivatives. 4,214,075, Cl. 536-17.00R.

Tadmor, Zehev: *See*—
Hold, Peter; Tadmor, Zehev; and Scharer, Hans R., 4,213,710, Cl. 366-81.000.

Taguchi, Tadashi: *See*—
Kodera, Yoshiaki; Watanabe, Kiyoyuki; Kadoya, Tetsuo; and Taguchi, Tadashi, 4,214,034, Cl. 428-315.000.

Taisei Kensetsu Kabushiki Kaisha: *See*—
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, 4,213,926, Cl. 264-74.000.

Tajiri, Hiromi: *See*—
Kawanami, Takao; Tajiri, Hiromi; and Uomori, Akiyoshi, 4,214,143, Cl. 219-97.000.

Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; Watanabe, Hiroshi; and Takagi, Toshinori, 4,213,844, Cl. 204-298.000.

Takahashi, Akihiko: *See*—
Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, 4,213,558, Cl. 228-176.000.

Takahatake, Yuriko: *See*—
Kondo, Kiyoshi; Matsui, Kiyohide; Negishi, Akira; and Takahatake, Yuriko, 4,214,097, Cl. 560-213.000.

Takamura, Seiji: *See*—
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.

Takasago Perfumery Co., Ltd.: *See*—
Moroe, Tatsuo; Komatsu, Akira; Doi, Kiyosumi; and Moroe, Mitio, 4,214,110, Cl. 585-241.000.

Takenaka, Mitsuaki: *See*—
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.

Takeuchi, Masayuki; Nakamura, Kenji; and Handa, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission device for a power-operated lawn mower. 4,213,288, Cl. 56-11.600.

Talroze, Viktor L.; Grishin, Vladimir D.; and Galushkin, Boris A., to Institut Khimicheskoi Fiziki Akademii Nauk USSR. Apparatus for radiochromatographic analysis of mixture of substances containing components tagged by radioactive isotopes. 4,214,161, Cl. 250-303.000.

Tamura, Masuhiko: *See*—
Kitamura, Takanori; and Tamura, Masuhiko, 4,214,111, Cl. 585-255.000.

Tanaka, Toru: *See*—
Komatsu, Makoto; Ohta, Tazuo; Tanaka, Toru; and Akagi, Kimiko, 4,214,100, Cl. 562-416.000.

Tatsumi, Susumu: *See*—
Imai, Chikara; Tatsumi, Susumu; and Eda, Tadahiro, 4,213,693, Cl. 355-14.00D.

Tauber, Arthur: *See*—
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,213,802, Cl. 148-101.000.
Taylor, Charles W.: *See*—
Ridyard, Denis R. A.; and Taylor, Charles W., 4,213,759, Cl. 8-643.000.
TDK Electronics Company Limited: *See*—
Yoneyama, Tetsuhito; Tomizawa, Shiro; Hori, Tetsuo; and Ojima, Teruhiko, 4,213,803, Cl. 148-102.000.
Tefft, Franklin A.; Perez, Ricardo L.; and Barnum, Ronald E., to United Technologies Corporation. Helicopter hover stability and cruise gust effect alleviation. 4,213,584, Cl. 244-17.130.
Tellier, Joseph C. Proximity control system. 4,214,241, Cl. 343-7.0PF.
Telling, Edward F., to Trewhella Bros. (UK) Ltd. Compacting apparatus. 4,213,384, Cl. 100-74.000.
Telling, Vera I., to Trewhella Bros. (UK) Ltd. Compacting apparatus. 4,213,386, Cl. 100-98.00R.
Teltone Corporation: *See*—
Questad, Philip J., 4,214,130, Cl. 179-81.00R.
Telxon Corporation: *See*—
See, Gary G., 4,214,172, Cl. 307-150.000.
Tennessee Valley Authority: *See*—
Shirley, Arthur R., Jr., 4,213,924, Cl. 264-7.000.
Teradyne, Inc.: *See*—
Kern, Walter P., 4,214,201, Cl. 324-158.00P.
Teraoka, Fuminori: *See*—
Kawaharazaki, Takashi; Teraoka, Fuminori; Kubota, Tatsushi; and Matsui, Kenji, 4,213,580, Cl. 242-107.000.
Terasawa, Yoshio: *See*—
Kimura, Shin; Fukui, Hiroshi; and Terasawa, Yoshio, 4,214,254, Cl. 357-38.000.
Terni-Societe per l'Industria e l'Elettricita S.p.A.: *See*—
Marianeschi, Edmondo; and Marini, Paolo, 4,213,792, Cl. 106-286.600.
Tetra Pak International AB: *See*—
Ernstsson, Ernst G.; and Nantin, Hans O. I., 4,213,795, Cl. 134-22.00C.
Texaco Inc.: *See*—
Cardenas, Ricardo L.; and Carlin, Joseph T., 4,213,500, Cl. 166-273.000.
Larkin, John M.; Cullen, William P.; Sung, Rodney L.; and Zoleski, Benjamin H., 4,214,083, Cl. 544-277.000.
Texas Gas Transport Company: *See*—
Bresie, Don A.; Fowler, Donald W.; and Burns, Jack M., 4,213,476, Cl. 137-2.000.
Texas Instruments Incorporated: *See*—
Padovani, Francois A.; Miller, Michael B.; Moore, James A.; Fowler, James H.; June, Malcom N.; Matthews, James D.; Morton, T. R.; Stotko, Norbert A.; and Palmer, Lewis B., 4,213,937, Cl. 422-142.000.
Schmidt, Robert W., 4,214,302, Cl. 364-200.000.
Textron, Inc.: *See*—
Thompson, Leo M.; Colt, John Z.; and Szpakowski, Robert J., 4,213,545, Cl. 222-386.500.
Thayer, Orla E. Axial flow valve. 4,213,371, Cl. 84-390.000.
Thiele, Geraldine H., to Oxford Hill, Ltd. Mouthwash and method for preventing and removing dental plaque. 4,214,006, Cl. 424-318.000.
Thiele, Kurt; Ahmed, Quazi; Adrian, Rudolf; and Jahn, Ulrich, to Siegfried Aktiengesellschaft. Chlorobenzyl phenoxy alkoxylates. 4,214,095, Cl. 560-57.000.
Thiem, James E. Dispenser for dispensing the contents of collapsible packages. 4,213,543, Cl. 222-103.000.
Thigpen, Ben B.: *See*—
Bovee, David B.; and Thigpen, Ben B., 4,214,128, Cl. 370-112.000.
Thomas, Dennis R.: *See*—
Robnett, James J.; and Thomas, Dennis R., 4,213,726, Cl. 414-420.000.
Thomas, Samuel J.: *See*—
Samour, Carlos M.; Jackson, Earl G.; Thomas, Samuel J.; and Davidson, Louie E., 4,213,486, Cl. 138-143.000.
Thompson, George H. B.; and Lovelace, David F., to ITT Industries, Incorporated. Fabrication of injection lasers utilizing epitaxial growth and selective diffusion. 4,213,808, Cl. 148-188.000.
Thompson, Leo M.; Colt, John Z.; and Szpakowski, Robert J., to Textron, Inc. Expanding bellows for expulsion tank. 4,213,545, Cl. 222-386.500.
Thompson, Roy R., Jr. Silver reclamation apparatus. 4,213,600, Cl. 266-170.000.
Thompson, Woodrow F. Trailer hitch. 4,213,627, Cl. 280-406.00A.
Thomson-CSF: *See*—
Felix, Pierre, 4,214,275, Cl. 358-223.000.
Mourier, Georges, 4,214,187, Cl. 315-111.800.
Thornton, Edward W. J., to Groupe Minier Sullivan Ltee/Sullivan Mining Group Ltd. Process for the concentration of mineral by flotation process. 4,213,942, Cl. 423-53.000.
Thurber, Mickey D., to Mechanical Seal & Service, Inc. Self-contained rotary mechanical seals. 4,213,618, Cl. 277-93.00R.
Thurmond, Elmer T., Jr., to Equipment Company of America. Drum lifter. 4,213,647, Cl. 294-90.000.
Tibolla, Julius F.: *See*—
Wittes, James M.; and Tibolla, Julius F., 4,213,669, Cl. 339-272.0UC.
Tielemans, Leonardus P. M.; and de Deugd, Johannes A. G., to U.S. Philips Corporation. Connecting rod bearing arrangement. 4,213,659, Cl. 308-167.000.
Tietz, Werner. Cylinder-lock mechanism and key means therefore. 4,213,316, Cl. 70-35.00B.
Timmer, Hendrikus J. M., to SKF Industrial Trading and Development Company B.V. Castor assembly. 4,213,225, Cl. 16-21.000.
Tippner, Richard E. Rotating electromagnetic solenoid motor. 4,214,178, Cl. 310-14.000.
Titmus Eurocon Kontaklinsen GmbH & Co. KG: *See*—
Hofer, Peter; and Kohl, Wolfgang, 4,214,014, Cl. 427-40.000.
Titow, Victor W.: *See*—
Clifton, John D.; and Titow, Victor W., 4,214,033, Cl. 428-255.000.
T'Jampens, Germain R.: *See*—
Giller, Henricus F. J. I.; and T'Jampens, Germain R., 4,213,662, Cl. 316-24.000.
TMC Corporation: *See*—
Krob, Erwin; and Svoboda, Josef, 4,213,629, Cl. 280-605.000.
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,213,630, Cl. 280-634.000.
Tochitani, Tomotada: *See*—
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,214,016, Cl. 427-54.100.
Tokita, Yoshiaki; and Okajima, Keisuke, to Hitachi, Ltd. Multi-processor data processing system. 4,214,305, Cl. 364-200.000.
Toledo Stamping & Manufacturing Company: *See*—
Scheppele, Lyle W., 4,213,525, Cl. 198-364.000.
Tominaga, Anri: *See*—
Mandai, Hiroshi; Tominaga, Anri; Yoshimura, Yoshikazu; and Isa, Hiroshi, 4,214,112, Cl. 585-532.000.
Tomizawa, Shiro: *See*—
Yoneyama, Tetsuhito; Tomizawa, Shiro; Hori, Tetsuo; and Ojima, Teruhiko, 4,213,803, Cl. 148-102.000.
Torii & Co., Ltd.: *See*—
Fujii, Setsuro; Sakurai, Yojiro; Nakayama, Toyoo; and Matsui, Ryoji, 4,214,093, Cl. 560-34.000.
Touhsaent, Robert E.: *See*—
Steiner, Robert H.; Duncan, Gary L.; and Touhsaent, Robert E., 4,214,039, Cl. 428-414.000.
Towmotor Corporation: *See*—
Wible, John E., 4,213,510, Cl. 180-68.500.
Towner, Ronald D.: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Lemke, Verne O.; Rathbun, Loren L.; and Towner, Ronald D., 4,213,332, Cl. 73-134.000.
Toyo Seikan Kaisha Limited: *See*—
Kubota, Kikuo; Yamagishi, Yoshiaki; and Yamaguchi, Masaru, 4,213,750, Cl. 425-531.000.
Toyoda Gosei Kabushiki-Kaisha (Toyoda Synthetics Co., Ltd.): *See*—
Manabe, Katsuhide; Masumi, Jiro; Tochitani, Tomotada; and Shinoda, Kenzo, 4,214,016, Cl. 427-54.100.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Koide, Tsuyoshi; and Oda, Yasuji, 4,214,309, Cl. 364-474.000.
Toyoda, Minoru; Horishima, Tohei; Sugimoto, Kenji; and Aoyama, Kensuke, to Taisei Kensetsu Kabushiki Kaisha; and Dai Nippon Printing Co., Ltd. Method for making a decorative plate used in a building. 4,213,926, Cl. 264-74.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,213,535, Cl. 220-20.500.
Hoshino, Tadayoshi; and Sudo, Yoichi, 4,213,634, Cl. 280-728.000.
Onishi, Sigeru, 4,213,431, Cl. 123-73.00R.
Yasui, Yasuyosi; Izuta, Mitugu; and Okaguchi, Sigeki, 4,213,660, Cl. 308-177.000.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, 4,213,651, Cl. 297-475.000.
Toyota Kodosha Kogyo Kabushiki Kaisha: *See*—
Inokuchi, Nobuyuki; and Hamada, Kouzo, 4,213,635, Cl. 280-737.000.
Trader, David A. Handbag lock. 4,213,314, Cl. 70-68.000.
Traub, Alan C.; and Vanzetti, Riccardo, to Vanzetti Infrared & Computer System Incorporated. Control of spot weld quality by infrared thermal sensing. 4,214,164, Cl. 250-338.000.
Trewhella Bros. (UK) Ltd.: *See*—
Telling, Edward F., 4,213,384, Cl. 100-74.000.
Telling, Vera I., 4,213,386, Cl. 100-98.00R.
Trombley, James E.: *See*—
Claypool, James P., 4,213,261, Cl. 42-16.000.
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B. Process of manufacturing gypsum products. 4,213,931, Cl. 264-234.000.
Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 4,213,553, Cl. 226-196.000.
TRW Inc.: *See*—
Lumby, Dale, 4,213,718, Cl. 403-197.000.
Murray, Ronald A.; and Piccirillo, Gary P., 4,213,665, Cl. 339-17.00D.
Wesson, Laurence N., 4,214,225, Cl. 338-155.000.
Tsang, Wei K., to Analog Devices, Incorporated. Forming an IC chip with buried zener diode. 4,213,806, Cl. 148-187.000.
Tschang, Pin S.: *See*—
Hayward, John S.; Snavely, Benjamin B.; and Tschang, Pin S., 4,214,264, Cl. 358-44.000.
Tschirky, John E.; and Sullivan, Wayne M., to Smith International, Inc. Downhole fire control. 4,213,508, Cl. 175-235.000.
Tsibris, John C. M., to University of Florida, Board of Regents, State of Florida for and on behalf of the. Affinity chromatography and substrate useful therefor. 4,213,860, Cl. 210-31.00C.

Tsuji, Kunio: *See—*
Hayata, Toshinori; Tsuji, Kunio; and Mitsui, Hajime, 4,213,681, Cl. 354-21.000.
Tsukada, Toshihisa, to Hitachi, Ltd. Liquid phase epitaxy method of forming a filimentary laser device. 4,213,805, Cl. 148-171.000.
Tsukakoshi, Yukio: *See—*
Sakamoto, Kiyoshi; Tsukakoshi, Yukio; and Oie, Naoyuki, 4,213,679, Cl. 353-72.000.
Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A. Device for introducing particles into analyzer of dustiness of gaseous medium. 4,213,325, Cl. 73-1.00G.
Turner, A. Franklin: *See—*
Roese, John A.; and Turner, A. Franklin, 4,214,267, Cl. 358-111.000.
Turner, Robert L., to Du Pont de Nemours, E. I., and Company. Treatment of aluminum flake to improve appearance of coating compositions. 4,213,886, Cl. 260-29.6MM.
Tuss, John J.: *See—*
Bell, Frederick K.; and Tuss, John J., 4,213,244, Cl. 33-1.00M.
Tutsek, Alexander: *See—*
Bartha, Peter; and Tutsek, Alexander, 4,213,789, Cl. 106-52.000.
Tyler, Derek E.: *See—*
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,213,496, Cl. 164-147.000.
Typke, Dieter: *See—*
Hoppe, Walter; and Typke, Dieter, 4,214,162, Cl. 250-311.000.
Uarco Incorporated: *See—*
Absler, Howard; Juszak, Joseph; and Gore, Thomas, 4,213,639, Cl. 282-11.50A.
Ubbelohde, Alfred R. J. P. Granite composition. 4,213,956, Cl. 423-448.000.
Ube Industries, Ltd.: *See—*
Nagai, Shigeki; Sekioka, Hakobu; Takenaka, Mitsuaki; Sakata, Masazumi; Kawaguchi, Yosio; Takamura, Seiji; and Nishimura, Minoru, 4,213,775, Cl. 71-103.000.
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Uddeholms Aktiebolag: *See—*
Broddevall, Bengt G., 4,213,820, Cl. 162-29.000.
Ueno, Hideo: *See—*
Inoue, Motozo; Kumeta, Mitsuzo; Ueno, Hideo; Okamura, Yoshinao; and Suzuki, Tadashi, 4,213,596, Cl. 254-134.30R.
Uhrig, Herbert: *See—*
Daubach, Ewald; Horn, Dieter; Hahn, Erwin; and Uhrig, Herbert, 4,213,900, Cl. 260-208.000.
Union Carbide Corporation: *See—*
Casciani, Ralph A.; Wilbern, Wilmer L.; Mangan, William E.; and Franson, Paul D., 4,213,955, Cl. 423-442.000.
Lowther, Frank E., 4,213,838, Cl. 204-176.000.
Seefried, Carl G., Jr.; Armstrong, George H.; and Van Cleve, Russell, 4,214,055, Cl. 521-137.000.
Wilson, Stephen T., 4,213,765, Cl. 44-15.00R.
Union Oil Company of California: *See—*
Riddick, Frank C., Jr.; and Peralta, Bernal, 4,213,850, Cl. 208-216.00R.
Union Pump Company: *See—*
Henshaw, Terry L., 4,213,742, Cl. 417-206.000.
Uniroyal A.G.: *See—*
Pasch, Lambert; and Wagemann, Heinz, 4,213,814, Cl. 156-242.000.
Uniroyal Ltd.: *See—*
Gilck, Lawrence J.; and Lojek, John S., 4,213,776, Cl. 71-117.000.
Unisearch Limited: *See—*
Coster, Hans G. L.; Ashcroft, Robert G.; and Smith, John R., 4,214,203, Cl. 324-425.000.
United Patents Trust Reg.-U.P.T.: *See—*
Rossollin, Jean-Claude, 4,213,378, Cl. 93-36.00A.
United States of America
Army: *See—*
Donnally, William, 4,214,231, Cl. 340-207.00R.
Drimmer, Bernard E., 4,213,391, Cl. 102-8.000.
Farrell, John W.; and Andrews, Jere L., 4,214,156, Cl. 250-231.0SE.
Hapgood, John H., 4,214,272, Cl. 358-170.000.
Jones, George R.; and Raimondi, Peter K., 4,214,271, Cl. 358-166.000.
O'Donnell, Richard V., 4,214,208, Cl. 455-1.000.
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,213,802, Cl. 148-101.000.
Shreve, James S., 4,213,697, Cl. 356-351.000.
Weiss, Frank, 4,214,240, Cl. 343-7.0PF.
Energy: *See—*
Freund, Samuel M.; Maier, William B., II; Beattie, Willard H.; and Holland, Redus F., 4,213,836, Cl. 204-157.10?.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Chamberlain, Frederick R. System for forming a quadrifid image comprising angularly related fields of view of a three dimensional object. 4,213,684, Cl. 354-118.000.
National Aeronautics and Space Administration: *See—*
Narasimhan, Keshavaiyengar Y.; Nathan, Robert; and Parthasarathy, Shakkottai P., 4,214,226, Cl. 367-27.000.
Navy: *See—*
Burton, Charles A., 4,213,646, Cl. 294-86.00A.
Dillard, George M., 4,214,239, Cl. 343-5.0VQ.
Geren, Keith E.; Sauer, Warren A.; and Young, Donald A., 4,214,313, Cl. 367-1.000.
Milton, A. Fenner; and Giallorenzi, Thomas G., 4,213,670, Cl. 350-96.160.
U.S. Philips Corporation: *See—*
De Deugd, Johannes A. G., 4,213,323, Cl. 72-358.000.
Everaarts, Klaas, 4,214,206, Cl. 375-4.000.
Giller, Henricus F. J. I.; and T'Jampens, Germain R., 4,213,662, Cl. 316-24.000.
Goerth, Joachim, 4,214,252, Cl. 357-23.000.
Severijns, Adrianus P.; and Staas, Frans A., 4,213,311, Cl. 62-514.00R.
Tielemans, Leonardus P. M.; and de Deugd, Johannes A. G., 4,213,659, Cl. 308-167.000.
van der Valk, Nicolaas J. L., 4,214,258, Cl. 358-4.000.
van Deutekom, Huibert J. H., 4,214,043, Cl. 429-27.000.
van Straaten, Jan, 4,214,260, Cl. 358-17.000.
United States Steel Corporation: *See—*
Friend, Donald L.; Grosko, John A.; and Liniger, Richard B., II, 4,213,829, Cl. 202-263.000.
United Technologies Corporation: *See—*
Galasso, Francis S.; and Veltri, Richard D., 4,214,037, Cl. 428-367.000.
Marmol, Ronald A., 4,213,661, Cl. 308-184.00R.
Schwarz, Frederick M., 4,213,296, Cl. 60-39.14R.
Tefft, Franklin A.; Perez, Ricardo L.; and Barnum, Ronald E., 4,213,584, Cl. 244-17.130.
von Hardenberg, Paul W.; Mard, Kenneth C.; and Lavoie, Edward, 4,213,518, Cl. 188-1.00B.
Wilson, Lloyd W., 4,214,042, Cl. 428-678.000.
Universal Instruments Corporation: *See—*
Ragard, Phillip A., 4,213,286, Cl. 53-493.000.
University of Arizona Foundation, The: *See—*
Hill, Henry A.; Figoski, John W.; and Ballard, Paul T., 4,213,706, Cl. 356-353.000.
University of California, Regents of the: *See—*
Spiess, Frederick N.; Boegeman, Dwight E.; Pavlicek, Frank V.; and Lowenstein, Carl D., 4,214,314, Cl. 367-2.000.
University of Florida, Board of Regents, State of Florida for and on behalf of the: *See—*
Tsibris, John C. M., 4,213,860, Cl. 210-31.00C.
University of Florida, Board of Regents, State of Florida, for the use and benefit of the: *See—*
Laitinen, Herbert A.; and Rosenfarb, Joseph, 4,214,017, Cl. 427-92.000.
Unsold, Eberhard: *See—*
Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,214,159, Cl. 250-288.000.
Uomori, Akiyoshi: *See—*
Kawanami, Takao; Tajiri, Hiromi; and Uomori, Akiyoshi, 4,214,143, Cl. 219-97.000.
UOP Inc.: *See—*
Carson, Don B., 4,214,114, Cl. 585-715.000.
de Rosset, Armand J., 4,213,913, Cl. 260-428.500.
Frame, Robert R., 4,213,877, Cl. 252-412.000.
Upjohn Company, The: *See—*
Brodasky, Thomas F., 4,213,326, Cl. 73-23.100.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., 4,214,052, Cl. 435-55.000.
Urich, George H., to Xerox Corporation. Halftone implementation apparatus. 4,214,277, Cl. 358-283.000.
Usel, Hubert. Electrically ignitable cartridge-less bullet. 4,213,392, Cl. 102-38.00R.
USM Corporation: *See—*
Hold, Peter; Tadmor, Zehev; and Scharer, Hans R., 4,213,710, Cl. 366-81.000.
Kelley, John S.; Grise, Frederick G. J.; and Lovell, Walter C., 4,213,324, Cl. 72-405.000.
Kulik, Alphonse C., 4,213,221, Cl. 12-12.400.
Ruhl, Edward A., 4,213,645, Cl. 293-145.000.
Valsamis, Lefteris N., 4,213,709, Cl. 366-76.000.
Utner, Ferdinand: *See—*
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,213,817, Cl. 156-474.000.
Vaginay, Yves: *See—*
Couchoud, Paul; and Vaginay, Yves, 4,214,069, Cl. 528-167.000.
Vahlensieck, Hans-Joachim: *See—*
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,213,908, Cl. 260-348.160.
Valsamis, Lefteris N., to USM Corporation. Rotary processor. 4,213,709, Cl. 366-76.000.
Van Buskirk, Jerry H.: *See—*
Donlon, Frances M.; and Van Buskirk, Jerry H., 4,213,204, Cl. 2-94.000.
Van Cleve, Russell: *See—*
Seefried, Carl G., Jr.; Armstrong, George H.; and Van Cleve, Russell, 4,214,055, Cl. 521-137.000.
Vandeman, Fred N.: *See—*
Kremp, Richard E.; and Vandeman, Fred N., 4,213,782, Cl. 430-432.000.
van den Berg, Gerrit H.: *See—*
Smakman, Robert; and van den Berg, Gerrit H., 4,213,859, Cl. 210-27.000.

Vandenbossche, Benjamin E., to American HCP. Low-cost flexible plastic heat exchanger. 4,213,498, Cl. 165-136.000.
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, to Australian Paper Manufacturers Limited. Pulping with quinones and hydroquinones. 4,213,821, Cl. 162-72.000.
Van Der Schee, Abraham C.: *See*—
Kunnen, Jan; and Van Der Schee, Abraham C., 4,214,022, Cl. 427-435.000.
van der Valk, Nicolaas J. L., to U.S. Philips Corporation. Portable television camera and tape recorder combination. 4,214,258, Cl. 358-4.000.
van Deutekom, Huibert J. H., to U.S. Philips Corporation. Rechargeable electrochemical cell. 4,214,043, Cl. 429-27.000.
Vandlik, Robert P.: *See*—
Gold, Vance B.; and Vandlik, Robert P., 4,213,319, Cl. 72-34.000.
VanDyke, Ronald D., to ACF Industries, Incorporated. Hitch head having manual jaw unlock. 4,213,590, Cl. 410-64.000.
van Kuijk, Josephus P. M., to Patlico Rights N.V. Heat storage and transmission apparatus for heat from a fluid heated by the sun. 4,213,563, Cl. 237-2.00B.
van Straaten, Jan, to U.S. Philips Corporation. Circuit for the line synchronization in a television receiver having a gated auxiliary control loop. 4,214,260, Cl. 358-17.000.
Van Tighem, Gary P.: *See*—
White, William R.; and Van Tighem, Gary P., 4,213,851, Cl. 209-12.000.
Vanzetti Infrared & Computer System Incorporated: *See*—
Traub, Alan C.; and Vanzetti, Riccardo, 4,214,164, Cl. 250-338.000.
Vanzetti, Riccardo: *See*—
Traub, Alan C.; and Vanzetti, Riccardo, 4,214,164, Cl. 250-338.000.
Varitrac AG: *See*—
Horowitz, Alexandre; and Cuypers, Martinus H., 4,213,350, Cl. 474-264.000.
Varma, Ravi K., to E. R. Squibb & Sons, Inc. Process for preparing steroidal [16α,17-d]cyclohexene-21-carboxylic acid esters. 4,213,912, Cl. 260-397.100.
Vee Arc Corporation: *See*—
Ottoson, Allen E., 4,214,190, Cl. 318-356.000.
Velasquez, Robert L. Automatic damper for furnace vent pipe. 4,213,477, Cl. 137-15.000.
Velazquez, Jacinto. Toy baseball game. 4,213,610, Cl. 273-93.00R.
Veltri, Richard D.: *See*—
Galasso, Francis S.; and Veltri, Richard D., 4,214,037, Cl. 428-367.000.
Verachtert, Antonius P. Excavators. 4,213,731, Cl. 414-723.000.
Vergottini, Roberto A.: *See*—
Attwell, Michael C.; Massiah, Thomas F.; Vergottini, Roberto A.; and Ziegler, Peter, 4,213,911, Cl. 260-397.100.
Vetrane, David D.: *See*—
Gudelis, Drasutis; and Vetrane, David D., 4,213,253, Cl. 35-19.00A.
Vetter, Harald: *See*—
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,213,817, Cl. 156-474.000.
Vickers Limited: *See*—
Portass, Michael L., 4,213,720, Cl. 405-195.000.
Vilmanis, Ilmars: *See*—
Funk, Smith A.; Klasen, Charles J.; and Vilmanis, Ilmars, 4,213,487, Cl. 138-149.000.
Vilsmeier, Gerhart: *See*—
Gaenge, Friedrich J.; Utner, Ferdinand; Vetter, Harald; and Vilsmeier, Gerhart, 4,213,817, Cl. 156-474.000.
Virginia Panel Corporation: *See*—
Braginetz, Paul A.; and Floyd, Paul D., 4,213,666, Cl. 339-75.00M.
Vishnev, Nikolai V.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.
Visser, Theodorus N.: *See*—
Schreurs, Gerardus C. M.; Raudenbusch, Werner T.; and Visser, Theodorus N., 4,214,068, Cl. 528-98.000.
Vockenhuber, Karl: *See*—
Keznickl, Eduard; and Boehm, Kurt, 4,214,268, Cl. 358-127.000.
Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Novel 4H-S-triazolo[4,3-A] [1,5]benzodiazepin-5-ones. 4,213,982, Cl. 424-248.520.
Vogtmann, Hans-Jorg; and Stumpp, Gerhard, to Robert Bosch GmbH. Fuel injection system. 4,213,434, Cl. 123-462.000.
Volkov, Anatoly T.: *See*—
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T., 4,213,358, Cl. 82-36.00R.
Volnaya, Olga E.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.
Volny, Vadim M.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,214,113, Cl. 585-634.000.
Volovik, Boris B.: *See*—
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.
Von Bennigsen-Mackiewicz, Andreas; and Von Bennigsen-Mackiewicz, Christoph. Sifting equipment for fine-grained bulk material, particularly flour. 4,213,855, Cl. 209-240.000.
Von Bennigsen-Mackiewicz, Christoph: *See*—
Von Bennigsen-Mackiewicz, Andreas; and Von Bennigsen-Mackiewicz, Christoph, 4,213,855, Cl. 209-240.000.
Vonderau, Raymond C.: *See*—
Wittig, Carl E.; and Vonderau, Raymond C., 4,213,823, Cl. 162-380.000.
Von Dziembowski, Kasimir: *See*—
Sterzel, Hans-Josef; Von Dziembowski, Kasimir; and Pirzer, Hans, 4,214,072, Cl. 528-272.000.
von Hardenberg, Paul W.; Mard, Kenneth C.; and Lavoie, Edward, to United Technologies Corporation. Fixed position pendular-type vibration absorber with linearization at fixed or variable frequencies. 4,213,518, Cl. 188-1.00B.
von Oertzen, Klaus: *See*—
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,214,082, Cl. 544-189.000.
von Tobel, Hans R.: *See*—
Moser, Helmut; and von Tobel, Hans R., 4,213,897, Cl. 260-154.000.
Vydrin, Vladimir N.; Berezin, Evgeny N.; and Dremin, Vladimir G. Roll-forging mill. 4,213,320, Cl. 72-189.000.
Vyvial, Larry A.: *See*—
Orum, Paul R.; and Vyvial, Larry A., 4,213,480, Cl. 137-556.000.
W. & A. Manufacturing Co., Inc.: *See*—
West, Wilbur C.; and Atkinson, James E., 4,213,408, Cl. 111-85.000.
W. C. Lamb: *See*—
Dufour, Martin J., 4,213,345, Cl. 73-637.000.
W. Haking Enterprises Limited: *See*—
Hattis, Russell E.; and Yan, Chan K., 4,213,687, Cl. 354-213.000.
W. Schlafhorst & Co.: *See*—
Kupper, Wilhelm, 4,213,290, Cl. 57-85.000.
Wachi, Masatada: *See*—
Niimi, Koji; Katoh, Mitsumi; and Wachi, Masatada, 4,213,366, Cl. 84-1.010.
Wagemann, Heinz: *See*—
Pasch, Lambert; and Wagemann, Heinz, 4,213,814, Cl. 156-242.000.
Wagner, Karl, to Fabrication Unlimited, Inc. Apparatus for separating sludge, oil and the like from contaminated water. 4,213,865, Cl. 210-522.000.
Wagner, Rudolf, to Rems-Werk Christian Foll und Sohne GmbH & Co. Transportable external thread cutting machine. 4,213,722, Cl. 408-73.000.
Wagner, Rudolf, to Rems-Werk Christian Foll und Sohne GmbH & Co. Thread cutting die stock. 4,213,723, Cl. 408-239.00A.
Waldmann, Helmut: *See*—
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,214,105, Cl. 568-771.000.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Derivatives of substituted N-alkyl imidazoles and compositions and methods containing the same. 4,213,991, Cl. 424-273.00R.
Walker, Peter S.: *See*—
Insall, John N.; and Walker, Peter S., 4,213,209, Cl. 3-1.911.
Wallrabenstein, Michael: *See*—
Brodowski, Walter; and Wallrabenstein, Michael, 4,213,890, Cl. 260-45.75W.
Walls, John E.; and Gillich, Thomas N., to American Hoechst Corporation. Lithographic plate finisher. 4,213,887, Cl. 260-29.60E.
Walsh, James L.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,214,315, Cl. 357-44.000.
Waltrip, Owen R., to Nuclear Supreme. Method of extracting a liquid electrolyte and other products from coal. 4,214,046, Cl. 429-198.000.
Wang, Ikai: *See*—
Chen, Nai Y.; and Wang, Ikai, 4,213,847, Cl. 208-111.000.
Wank, Joachim: *See*—
Binsack, Rudolf; Wank, Joachim; and Reese, Eckart, 4,214,062, Cl. 525-470.000.
Ward, Robert R.; Chang, Richard C.; Danos, James C.; and Carden, Joseph A., Jr., to Monsanto Company. Processes for coating bundles of hollow fiber membranes. 4,214,020, Cl. 427-296.000.
Ware, Peter G., to Dunlop Limited. Method and apparatus for manufacturing vehicle wheel rims from spirally wound sheet metal. 4,213,234, Cl. 29-159.100.
Warncke, Ernst; and Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Breathing device having oxygen donor chemical cartridge. 4,213,453, Cl. 128-202.260.
Warner Electric Brake & Clutch Company: *See*—
Modersohn, Charles W., 4,213,521, Cl. 192-18.00R.
Warner, Gary J.: *See*—
Roeseler, William G.; Warner, Gary J.; and Odell, Richard B., 4,213,587, Cl. 244-213.000.
Warner-Lambert Company: *See*—
Ferraro, Frank A.; and Kiraly, Ernest F., 4,213,240, Cl. 30-47.000.
Warner, William J. Remote control apparatus. 4,214,229, Cl. 340-148.000.
Warwick, William A.: *See*—
Sowter, Brian R.; and Warwick, William A., 4,214,221, Cl. 335-212.000.
Watanabe, Hiroshi: *See*—
Morimoto, Kiyoshi; Watanabe, Hiroshi; and Takagi, Toshinori, 4,213,844, Cl. 204-298.000.
Watanabe, Kiyoyuki: *See*—
Kodera, Yoshiaki; Watanabe, Kiyoyuki; Kadoya, Tetsuo; and Taguchi, Tadashi, 4,214,034, Cl. 428-315.000.

Watanabe, Seizaburo; and Matsuki, Yutaka, to Asahi-Dow Limited. Expanded olefin polymer. 4,214,054, Cl. 521-95.000.
Watanabe, Toshiaki; and Yuhara, Hideo, to Okuma Machinery Works Ltd. System for automatic management of tool life. 4,214,191, Cl. 318-561.000.
Watson, Thomas E., to Westinghouse Electric Corp. Oil separation and return system for centrifugal refrigerant compressors. 4,213,307, Cl. 62-192.000.
Watts, Eric A.: *See—*
Hadley, Michael S.; and Watts, Eric A., 4,213,983, Cl. 424-250.000.
Wear, George H., to General Tire & Rubber Company, The. Thermoformable, high impact low-smoke plastic. 4,213,891, Cl. 260-45.75S.
Weaver, Ralph W.: *See—*
Krieger, Raymond L.; Weaver, Ralph W.; and Able, Edward T., 4,213,333, Cl. 73-136.00R.
Webb, Robert H.: *See—*
Pomerantzeff, Oleg; and Webb, Robert H., 4,213,678, Cl. 351-7.000.
Weber, Heinrich: *See—*
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.
Weber, Rolf-Ortwin: *See—*
Gebert, Ulrich; Musil, Josef; and Weber, Rolf-Ortwin, 4,213,986, Cl. 424-250.000.
Weber, Rudolf: *See—*
Bauer, Klaus; Goldmann, Wolf; Kretzer, Horst; Weber, Heinrich; Beyer, Rudiger; Kreft, Wilfried; Schaberg, Frank; Weber, Rudolf; Schmelter, Herbert; Ritzmann, Horst; Schnieder, Erich; and Schepers, Georg, 4,213,790, Cl. 106-100.000.
Wechsung, Reiner: *See—*
Hillenkamp, Franz; Kaufmann, Raimund; Niltsche, Rainer; Unsold, Eberhard; and Wechsung, Reiner, 4,214,159, Cl. 250-288.000.
Wei, Peter H. L.: *See—*
Fenichel, Richard L.; Wei, Peter H. L.; Gregory, Francis J.; and Alburn, Harvey E., 4,214,089, Cl. 548-151.000.
Weik, Kirby B., to Koehler-Dayton, Inc. Aircraft seat with concealed locking and releasing mechanism. 4,213,593, Cl. 248-501.000.
Weil, Kurt W.: *See—*
Katz, Louis; and Weil, Kurt W., 4,213,464, Cl. 128-645.000.
Weiner, Israel H. Tick removing forceps. 4,213,460, Cl. 128-303.00R.
Weinrich, Erwin: *See—*
Rose, David; Weinrich, Erwin; and Lieske, Edgar, 4,213,758, Cl. 8-409.000.
Weis, Siegfried K.: *See—*
Frost, Charles C.; and Weis, Siegfried K., 4,213,523, Cl. 193-37.000.
Weiss, Frank, to United States of America, Army. Coded pulse radar fuze. 4,214,240, Cl. 343-7.0PF.
Weiss, Gerhard: *See—*
Franzen, Jochen; and Weiss, Gerhard, 4,213,557, Cl. 228-122.000.
Wellons, Edwin L.: *See—*
Hurt, Frank K.; and Wellons, Edwin L., 4,213,743, Cl. 417-229.000.
Wells, John L.: *See—*
Reinertson, John E.; and Wells, John L., 4,213,348, Cl. 73-765.000.
Wenham, Douglas L., to AHI Operations Limited. Apparatus for sampling a flow of liquid from a fluid at least some of which is a liquid. 4,213,341, Cl. 73-421.00A.
Wens, Johannes C., to Smit Ovens Nijmegen B.V. System for sealing the rotary tube of a rotary tubular kiln. 4,213,754, Cl. 432-115.000.
Wentz, Edward C.: *See—*
Conner, Edmond E.; and Wentz, Edward C., 4,214,199, Cl. 323-6.000.
Werner & Pfleiderer: *See—*
Friedrich, Reinhard, 4,213,747, Cl. 425-144.000.
Werthmann, Wilfried, to Standex International GmbH, Firma. Method of producing large-format embossing tools. 4,213,819, Cl. 156-660.000.
Wessling, Ritchie A.: *See—*
Klingler, Thomas C.; Wessling, Ritchie A.; and Gibbs, Dale S., 4,214,096, Cl. 560-147.000.
Wesson, Laurence N., to TRW Inc. Signal transducing device. 4,214,225, Cl. 338-155.000.
West Electric Co., Ltd.: *See—*
Hayata, Toshinori; Tsuji, Kunio; and Mitsui, Hajime, 4,213,681, Cl. 354-21.000.
West, Wilbur C.; and Atkinson, James E., to W. & A. Manufacturing Co., Inc. Combination ripper, mixer and planter. 4,213,408, Cl. 111-85.000.
Western Electric Company, Inc.: *See—*
Jones, William T., Jr.; and Moulis, Edward J., 4,214,120, Cl. 174-52.0FP.
Western Geophysical Co. of America: *See—*
Bovee, David B.; and Thigpen, Ben B., 4,214,128, Cl. 370-112.000.
Western Reserve Electronics, Inc.: *See—*
Wise, David S., 4,213,696, Cl. 355-45.000.
Westinghouse Brake and Signal Co. Ltd.: *See—*
Bowles, Colin M., 4,213,588, Cl. 246-259.000.
Westinghouse Electric Corp.: *See—*
Alvino, William M.; and Frost, Lawrence W., 4,214,071, Cl. 528-222.000.
Conner, Edmond E.; and Wentz, Edward C., 4,214,199, Cl. 323-6.000.
Cooper, Frank W., Jr., 4,213,732, Cl. 414-728.000.
Noreika, Alexander J.; and Francombe, Maurice H., 4,213,781, Cl. 75-134.00P.
Watson, Thomas E., 4,213,307, Cl. 62-192.000.
Westley, John, to Hoffmann-La Roche Inc. Therapeutic agent for improving cardiovascular function. 4,213,997, Cl. 424-283.000.
Wetzel, Jon C., to American Home Products Corporation. Injectable anesthetic. 4,213,981, Cl. 424-247.000.
Weyl, Reinhard: *See—*
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.
Wheeler, Ronald E.; and King, William F., to Chevron Research Company. Use of oxadiazole derivatives for corn root worm control. 4,213,973, Cl. 424-200.000.
Whitaker, James L., to Robb, Frank B., a part interest. Means for stacking and shipping containers in multiples. 4,213,529, Cl. 206-427.000.
White Consolidated Industries, Inc.: *See—*
Holtkamp, Calvin J., 4,214,224, Cl. 337-323.000.
White, William R.; and Van Tighem, Gary P., to Occidental Petroleum Corporation. Flotation separation of glass from a mixture of comminuted inorganic materials using hydrocarbon sulfonates. 4,213,851, Cl. 209-12.000.
Whitehurst, Darrell D.: *See—*
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,213,921, Cl. 568-455.000.
Whitfill, Donald L., to Conoco, Inc. Determination of chromate ion in drilling mud filtrates. 4,213,762, Cl. 23-230.00R.
Whiting, Thomas A. Astronomical optical simulator. 4,213,254, Cl. 35-43.000.
Whiting, Winslow. Stabbing guide. 4,213,237, Cl. 29-272.000.
Wholey, James N.: *See—*
Omori, Masahiro; Wholey, James N.; and Anderson, J. Ross, 4,213,840, Cl. 204-192.00C.
Wible, John E., to Towmotor Corporation. Article retention device. 4,213,510, Cl. 180-68.500.
Widdershoven, Louis H., to Raypak Produkten B.V. Draft interrupter of a gas-fired boiler installation. 4,213,406, Cl. 110-326.000.
Wikoff, Mark W., to Best & Donovan. Tensiometer. 4,213,334, Cl. 73-144.000.
Wilbern, Wilmer L.: *See—*
Casciani, Ralph A.; Wilbern, Wilmer L.; Mangan, William E.; and Franson, Paul D., 4,213,955, Cl. 423-442.000.
Wildman, John R.; and Meyer, Burton C., to Marvin Glass & Associates. Shiftable game target and projectile launching device for actuating same. 4,213,612, Cl. 273-355.000.
Wildman, John R.: *See—*
Erickson, Erick E.; Wildman, John R.; and Meyer, Burton C., 4,213,268, Cl. 46-202.000.
Wilkerson, Edward D. Vehicle wheel alignment adjustment device. 4,213,631, Cl. 280-661.000.
Will Ross, Inc.: *See—*
Bryson, John D., 4,213,923, Cl. 261-120.000.
William H. Rorer, Inc.: *See—*
Campbell, Henry F.; Santora, Norman J.; and Douglas, George H., 4,214,003, Cl. 424-301.000.
Williams, George F.: *See—*
Olsen, Everett O.; Estes, Robert F.; Rezendes, Paul W.; and Williams, George F., 4,213,478, Cl. 137-85.000.
Williams, James R., to General Motors Corporation. Cooling air control valve. 4,213,738, Cl. 416-95.000.
Williams, Lloyd E.; and Mays, Robert K., to J. M. Huber Corporation. Synthetic amorphous sodium aluminosilicate base exchange materials. 4,213,874, Cl. 252-174.250.
Williams, Richard; and Arie, Yehuda, to RCA Corporation. Tellurium schottky barrier contact for amorphous silicon solar cells. 4,213,798, Cl. 136-89.0SJ.
Willms, Rolf: *See—*
Haese, Egon; Moll, Hans; and Willms, Rolf, 4,213,945, Cl. 423-240.000.
Wilmoth, Eugene: *See—*
Cowles, Clarence W.; Breashears, James C.; and Mungons, Edwin M., 4,213,729, Cl. 414-462.000.
Wilson, Bobby R. Tooth paste dispenser. 4,213,542, Cl. 222-102.000.
Wilson, Eddie K., Sr. Process for producing portland and other hydraulic cements. 4,213,791, Cl. 106-100.000.
Wilson, Frederick M. Artificial heart and method of pumping blood. 4,213,207, Cl. 3-1.700.
Wilson, Lloyd W., to United Technologies Corporation. Titanium bearing MCrAlY type alloy and composite articles. 4,214,042, Cl. 428-678.000.
Wilson, Robert E. Device to improve shooting a basketball. 4,213,606, Cl. 273-1.50A.
Wilson, Stephen T., to Union Carbide Corporation. Oxidative coal desulfurization using lime to regenerate alkali metal hydroxide from reaction product. 4,213,765, Cl. 44-15.00R.
Wimpfheimer, Hans: *See—*
Dalal, Hormazdyar M.; Ghafghaichi, Majid; Kasprzak, Lucian A.; and Wimpfheimer, Hans, 4,214,256, Cl. 357-71.000.
Winch, Allen R., to Cotton Incorporated. Impregnator/rinser. 4,213,218, Cl. 8-151.000.
Windele, Josef, to Siemens Aktiengesellschaft. Recording carrier transport assembly for use with side margin punched recording carrier webs. 4,213,551, Cl. 226-74.000.
Windmoller & Holscher: *See—*
Geretzki, Helmut, 4,213,388, Cl. 101-216.000.
Wipff, Frank P., to RCA Corporation. Cadence suppression system. 4,214,126, Cl. 179-1.50M.

Wise, David S., to Western Reserve Electronics, Inc. Scan mechanism for a microfilm reader/printer. 4,213,696, Cl. 355-45.000.
Witco Chemical Corporation: *See—*
Bitely, Clarence J., Jr.; Dromgold, Luther D.; and Murray, William S., Jr., 4,213,868, Cl. 252-11.000.
Witiak, Donald T.; Carr, John B.; and Mersmaan, Harry J., to Shell Oil Company. Inhibition of lipogenesis. 4,213,998, Cl. 424-285.000.
Witiak, Donald T.; Carr, John B.; and Mersmann, Harry J., to Shell Oil Company. Inhibition of lipogenesis. 4,213,999, Cl. 424-285.000.
Wittes, James M., to GTE Sylvania Wiring Devices Incorporated. Dead front connector. 4,213,667, Cl. 339-103.00R.
Wittes, James M.; and Tibolla, Julius F., to GTE Sylvania Wiring Devices Incorporated. Terminal collar. 4,213,669, Cl. 339-272.0UC.
Wittig, Carl E.; and Vonderau, Raymond C., to Beloit Corporation. Paper making machine screen with staggered foils. 4,213,823, Cl. 162-380.000.
Witwer, Alan D.: *See—*
Goodnight, Hershel E.; and Witwer, Alan D., 4,213,935, Cl. 422-111.000.
WMI Corporation: *See—*
Jones, Charles E., 4,213,370, Cl. 84-291.000.
Woinsky, Samuel G., to Occidental Petroleum Corporation. Process and system for recovery of energy from geothermal brines and other water containing sources. 4,213,302, Cl. 60-641.000.
Wolf, Anthony D., to Du Pont de Nemours, E. I., and Company. Herbicidal substituted bicyclic triazoles. 4,213,773, Cl. 71-92.000.
Wolford, Byron F.; and Rose, John F. Rotary shaft position switch. 4,214,133, Cl. 200-31.00R.
Womeldorph, Donald E., Jr.: *See—*
Blake, Larry V.; Womeldorph, Donald E., Jr.; Surber, Oliver M.; and James, John P., 4,213,856, Cl. 209-250.000.
Wood, Bruce G. Insulative wide style watchband. 4,213,548, Cl. 224-168.000.
Wood, Peter J.: *See—*
Pugsley, Peter C.; and Wood, Peter J., 4,214,276, Cl. 358-256.000.
Wooding, David L.; and Pletcher, Robert W., to Eastman Kodak Company. Cleaning station. 4,213,794, Cl. 134-6.000.
Wooding, Robert L., to Robertshaw Controls Company. Alarm clock construction. 4,213,291, Cl. 368-263.000.
Worner, Michael: *See—*
Liebert, Oskar; and Worner, Michael, 4,213,390, Cl. 101-365.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., to Upjohn Company, The. Process for preparing 9α-OH BN acid methyl ester. 4,214,051, Cl. 435-55.000.
Wovcha, Merle G.; Antosz, Frederick J.; Beaton, John M.; Garcia, Alfred B.; and Kominek, Leo A., to Upjohn Company, The. Process for preparing 9α-OH BN alcohol. 4,214,052, Cl. 435-55.000.
Wright, David H.: *See—*
Gillot, Gary W.; and Wright, David H., 4,213,680, Cl. 354-12.000.
Wright, James R.: *See—*
Richardson, Kenneth; Plews, Rhona M.; and Wright, James R., 4,214,074, Cl. 536-10.000.
Wuertele, Lothar: *See—*
Hahn, Erwin; Magerkurth, Bernhard; Lach, Dietrich; and Wuertele, Lothar, 4,213,760, Cl. 8-94.170.
Wuerthner, Herbert: *See—*
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,213,630, Cl. 280-634.000.
Wuerz, Albrecht: *See—*
Kretschmer, Alfred; Ruettiger, Wilhelm; and Wuerz, Albrecht, 4,213,217, Cl. 8-151.000.
Wulf, Helmut: *See—*
Mehren, Herbert; and Wulf, Helmut, 4,213,396, Cl. 104-130.000.
Wunder, Friedrich: *See—*
Freudenberger, Dieter; and Wunder, Friedrich, 4,214,106, Cl. 568-864.000.
Wunderlich, Klaus: *See—*
Berg, Gerhard; Hohmann, Walter; Reubke, Karl-Julius; and Wunderlich, Klaus, 4,213,909, Cl. 260-371.000.
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,214,082, Cl. 544-189.000.
Wyatt, John G., to Lodge-Cottrell, Ltd. Method and means for distributing gas along an extended inlet portion of gas treatment means. 4,213,766, Cl. 55-2.000.
Xeda International S.A.: *See—*
Sardo, Alberto, 4,213,533, Cl. 209-654.000.
Xerox Corporation: *See—*
Halfhill, Martin O.; and Jacques, James O., 4,214,280, Cl. 360-53.000.
Urich, George H., 4,214,277, Cl. 358-283.000.
Yabe, Isao: *See—*
Mabuchi, Hiroshi; and Yabe, Isao, 4,213,293, Cl. 368-152.000.
Yada, Kozo: *See—*
Kiyono, Hiroshi; Ishimoto, Akio; Noda, Yoichiro; and Yada, Kozo, 4,213,925, Cl. 264-22.000.
Yagaki, Kazuhito: *See—*
Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toyohiko, 4,213,946, Cl. 423-242.000.
Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Programmed exposure control system for a camera. 4,213,682, Cl. 354-23.00D.
Yamagishi, Yoshiaki: *See—*
Kubota, Kikuo; Yamagishi, Yoshiaki; and Yamaguchi, Masaru, 4,213,750, Cl. 425-531.000.
Yamaguchi, Masaru: *See—*
Kubota, Kikuo; Yamagishi, Yoshiaki; and Yamaguchi, Masaru, 4,213,750, Cl. 425-531.000.
Yamashita, Sadahiko: *See—*
Saito, Mitsuo; and Yamashita, Sadahiko, 4,214,217, Cl. 334-45.000.
Saito, Mitsuo; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,214,218, Cl. 334-45.000.
Yamauchi, Masaaki: *See—*
Hase, Yoshinobu; Yamauchi, Masaaki; and Handa, Ryozo, 4,214,007, Cl. 426-44.000.
Yamauchi, Satoshi, to Ricoh Company, Ltd. Method and color television picture tube for reproducing three-dimensional image. 4,214,257, Cl. 358-3.000.
Yan, Chan K.: *See—*
Hattis, Russell E.; and Yan, Chan K., 4,213,687, Cl. 354-213.000.
Yanagida, Kiyomi: *See—*
Hirobe, Koei; Yanagida, Kiyomi; Hirokane, Tadashi; and Takahashi, Akihiko, 4,213,558, Cl. 228-176.000.
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., to Olin Corporation. Electromagnetic casting apparatus. 4,213,496, Cl. 164-147.000.
Yascheritsyn, Petr I.; Sidorenko, Valery A.; Morgunsky, Evgeny I.; Vishnev, Nikolai V.; Bureika, Mindaugas N.; Plotnikov, Vladimir A.; and Volkov, Anatoly T. Rotary cutting tool. 4,213,358, Cl. 82-36.00R.
Yashiro, Yuji: *See—*
Sasaki, Takehiko; and Yashiro, Yuji, 4,213,372, Cl. 84-470.00R.
Yasui, Yasuyosi; Izuta, Mitugu; and Okaguchi, Sigeki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Bearing assembly construction. 4,213,660, Cl. 308-177.000.
Yokogawa Electric Works, Ltd.: *See—*
Fujita, Hisaya; Ando, Hiroshi; and Sato, Setsuo, 4,214,250, Cl. 346-145.000.
Yokogawa, Tomohisa, to Pioneer Electronic Corporation. Electrostatic destruction preventing circuit for use in a receiver. 4,214,211, Cl. 455-287.000.
Yokoi, Shinji: *See—*
Nakagami, Kazuto; Yokoi, Shinji; Nishimura, Kenji; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Ryuji; and Kojima, Mikio, 4,213,987, Cl. 424-251.000.
Yokokawa, Sumio: *See—*
Otsuka, Kei; Shigehara, Masamichi; and Yokokawa, Sumio, 4,214,289, Cl. 361-20.000.
Yoneyama, Tetsuhito; Tomizawa, Shiro; Hori, Tetsuo; and Ojima, Teruhiko, to TDK Electronics Company Limited. $R_2Co_{17}$ Rare type-earth-cobalt, permanent magnet material and process for producing the same. 4,213,803, Cl. 148-102.000.
Yoshimura, Yoshikazu: *See—*
Mandai, Hiroshi; Tominaga, Anri; Yoshimura, Yoshikazu; and Isa, Hiroshi, 4,214,112, Cl. 585-532.000.
Yoshitsugu, Noritada; Motonami, Masanao; and Katsuno, Mitsuaki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt system. 4,213,651, Cl. 297-475.000.
Young, Donald A.: *See—*
Geren, Keith E.; Sauer, Warren A.; and Young, Donald A., 4,214,313, Cl. 367-1.000.
Young, William C., to Bell Telephone Laboratories, Incorporated. Apparatus and method of molding a biconical socket. 4,213,932, Cl. 264-236.000.
Youngstown Sheet and Tube Company: *See—*
Barnes, Floyd A., Jr., 4,213,322, Cl. 72-357.000.
Yuasa, Takeo: *See—*
Ibata, Jyoji; Fukui, Hisaaki; Yuasa, Takeo; and Katoh, Michio, 4,214,026, Cl. 428-67.000.
Yuhara, Hideo: *See—*
Watanabe, Toshiaki; and Yuhara, Hideo, 4,214,191, Cl. 318-561.000.
Yun, Ik Y.: *See—*
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,213,496, Cl. 164-147.000.
Zaar, Wolfgang, to Chemische Werke Huls Aktiengesellschaft. 1,5,9-Cyclododecatriene from butadiene trimerization using dibenzylbenzenes. 4,214,108, Cl. 585-23.000.
Zahnradfabrik Friedrichshafen AG: *See—*
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,213,514, Cl. 180-308.000.
Zarzosa-Castilla, Agustin F.; and Parcero-de Zarzosa, Ma. Hilda. Construction of roofs, floors and beams. 4,213,281, Cl. 52-323.000.
Zavodian, Vitaly V.: *See—*
Kozlov, Anatoly E.; Budzan, Bogdan P.; Dudko, Daniil A.; Maximovich, Boleslav I.; Zavodian, Vitaly V.; Mozzhukhin, Anatoly A.; Sotchenko, Vladimir P.; Golovnin, Vladimir M.; and Farrakhov, Nail S., 4,214,139, Cl. 219-9.500.
Zaznobin, Anatoly M.: *See—*
Polovnikov, Sergei V.; Zaznobin, Anatoly M.; Masalov, Gennady F.; and Mischenkov, Alexandr A., 4,213,346, Cl. 73-660.000.
Zeidler, Guenter: *See—*
Aulich, Hubert; Douklias, Nikolaos; Hacker, Heinz; and Zeidler, Guenter, 4,213,672, Cl. 350-96.230.
Zenkert, Heinrich: *See—*
Eggert, Hans-Joachim; Zenkert, Heinrich; Kuehne, Rudi; and Oberberger, Otto, 4,213,532, Cl. 206-504.000.
Zerbst, Helmut: *See—*
Dietrich, Isolde; Fox, Fred; Knapek, Erwin; Nachtrieb, Karl; Weyl, Reinhard; Zerbst, Helmut; and Lefranc, Guy, 4,214,166, Cl. 250-396.0ML.
Zerbst, Manfred, to Siemens Aktiengesellschaft. Apparatus for pulling monocrystalline ribbon-like bodies out of a molten crystalline film. 4,213,940, Cl. 422-246.000.

Zhamkov, Nikolai V.: *See*—
Tumanov, Evgeny S.; Zhamkov, Nikolai V.; and Kudryavtsev, Lev A., 4,213,325, Cl. 73-1.00G.

Ziegler, Peter: *See*—
Attwell, Michael C.; Massiah, Thomas F.; Vergottini, Roberto A.; and Ziegler, Peter, 4,213,911, Cl. 260-397.100.

Zissimopoulos, Nicholas, to Baxter Travenol Laboratories, Inc. Electrical indicator means for indicating the correct position of a casette in flow controlling. 4,214,237, Cl. 340-686.000.

Zlobin, Vitaly I.: *See*—
Trutnev, Viktor A.; Zlobin, Vitaly I.; Kushnarenko, Valentin K.; Ignatov, Valentin B.; Gannota, Boris V.; Ambartsumyan, Nikolai S.; and Volovik, Boris B., 4,213,931, Cl. 264-234.000.

Zoleski, Benjamin H.: *See*—
Larkin, John M.; Cullen, William P.; Sung, Rodney L.; and Zoleski, Benjamin H., 4,214,083, Cl. 544-277.000.

Zudkevitch, David; Khanna, Nirmal K.; and Raczynski, Robert F., to Allied Chemical Corporation. Distillation for separating dialkylketones from lower chlorohydrocarbons. 4,213,832, Cl. 203-95.000.

Zvanut, Albert J.; and Sierdzinski, Michael S., to Stoody Company. Mild steel, flux-cored electrode for arc welding. 4,214,145, Cl. 219-145.220.

Zwar, Kurt: *See*—
Raggenbass, Werner; and Zwar, Kurt, 4,214,177, Cl. 307-355.000.

Zweben, Leon L. Mercury vapor purifier enclosure. 4,213,755, Cl. 433-49.000.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 22ND DAY OF JULY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Borden, John V. Dental handpiece. Re. 30,340, Cl. 433-126.000.

Golas, Eugene A.; and Singh, Shri N., to United States Steel Corporation. Method and single piece annular nozzle to prevent alumina buildup during continuous casting of Al-killed steel. Re. 30,343, Cl. 222-590.000.

Klaber, Michael C. Foldable pen. Re. 30,346, Cl. 401-131.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., Re. 30,341, Cl. 198-834.000.

Lapeyre, James M., to Laitram Corporation, The. Conveyor drive. Re. 30,341, Cl. 198-834.000.

McNeil, Harold L., to Temple Baptist Church, a part interest. Round trampoline. Re. 30,344, Cl. 272-65.000.

Micro Electronics, Inc.: *See*—
Perrino, Joseph A., Re. 30,342, Cl. 81-9.50B.

Mobil Oil Corporation: *See*—
Musgrave, Albert W., Re. 30,347, Cl. 367-51.000.

Musgrave, Albert W., to Mobil Oil Corporation. Corrections for seismic data obtained from expanding-spread. Re. 30,347, Cl. 367-51.000.

Perrino, Joseph A., to Micro Electronics, Inc. Wire stripper having replaceable blades. Re. 30,342, Cl. 81-9.50B.

Singh, Shri N.: *See*—
Golas, Eugene A.; and Singh, Shri N., Re. 30,343, Cl. 222-590.000.

Temple Baptist Church: *See*—
McNeil, Harold L., Re. 30,344, Cl. 272-65.000.

United States Steel Corporation: *See*—
Golas, Eugene A.; and Singh, Shri N., Re. 30,343, Cl. 222-590.000.

# LIST OF PLANT PATENTEES

Holtkamp, Hermann, Sr. African violet plant. 4,577, 7-22-80, Cl. 69.000.

Holtkamp, Hermann, Sr. African violet plant. 4,578, 7-22-80, Cl. 69.000.

Jackson & Perkins Co.: *See*—
Warriner, William A., 4,576, Cl. 20.000.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,576, 7-22-80, Cl. 20.000.

# LIST OF DESIGN PATENTEES

Albertson, Robert V. Ratchet wrench lever. 255,978, 7-22-80, Cl. D8-25.000.

American Home Products Corporation: *See*—
Kelly, Roger L., 255,971, Cl. D7-102.000.

American Hospital Supply Corporation: *See*—
Nilles, John D.; and Stankiewicz, Stanley L., 256,050, Cl. D24-12.000.

Andersen, Niels R., to Dansk International Designs Ltd. Cup. 255,967, 7-22-80, Cl. D7-9.000.

Anderson, Bernard T.; and Yedinak, Theodore, to B & T Manufacturing Corporation. Shelf for supporting cans. 255,964, 7-22-80, Cl. D6-181.000.

Armstrong, George W.; and Aronson, Eric G., to Sea-Land Service, Inc. Cargo restraint clip. 255,983, 7-22-80, Cl. D8-382.000.

Aronson, Eric G.: *See*—
Armstrong, George W.; and Aronson, Eric G., 255,983, Cl. D8-382.000.

B & T Manufacturing Corporation: *See*—
Anderson, Bernard T.; and Yedinak, Theodore, 255,964, Cl. D6-181.000.

Baker, Bertrand M. Cot. 255,963, 7-22-80, Cl. D6-79.000.

Barr, Josef J. Earring. 256,003, 7-22-80, Cl. D11-43.000.

Bauer, Russell E. Armored car body. 256,005, 7-22-80, Cl. D12-12.000.

Beaman, Lee A. Card and chip rack. 256,034, 7-22-80, Cl. D21-55.000.

Bell, Mace H., Jr.: *See*—
Cuccio, John; and Bell, Mace H., Jr., 256,006, Cl. D12-40.000.

Beller, Frank W., to Recreation Systems Co. Child recreation climber structure. 256,040, 7-22-80, Cl. D21-245.000.

Bio-Plas: *See*—
De Vaughn, Donald H., 256,052, Cl. D24-55.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Franek, Wayne J., to National Presto Industries, Inc. Hot air corn popper. 256,019, 7-22-80, Cl. D15-105.000.

Boursaw, Raymond O. Ratchet tool handle. 255,979, 7-22-80, Cl. D8-25.000.

Brooks, James O. Hanging ash receiver or the like. 256,058, 7-22-80, Cl. D27-14.000.

Brown, Rex M. Fireplace hood. 256,048, 7-22-80, Cl. D23-151.000.

Brown & Sharpe Manufacturing Company: *See*—
Merchant, H. Jackson, 255,998, Cl. D10-73.000.

Browning, Charles E., to Browning, Charles E. Sun shade or similar article. 255,958, 7-22-80, Cl. D3-5.000.

Budd Company, The: *See*—
Cuccio, John; and Bell, Mace H., Jr., 256,006, Cl. D12-40.000.

Burg, Klaus, to Procter & Gamble Company, The. Nonwoven sheet material or the like. 256,063, 7-22-80, Cl. D92-1.00P.

Campbell, John D.: *See*—
Kozlowski, Edward C.; and Campbell, John D., 255,984, Cl. D9-1.000.

Carbo, Henry. Record album jacket opener. 255,981, 7-22-80, Cl. D8-98.000.

Card, David R., to Champion International Corporation. Corner pad blank. 255,992, 7-22-80, Cl. D9-245.000.

Champion International Corporation: *See*—
Card, David R., 255,992, Cl. D9-245.000.
Lambert, Herbert L., 255,993, Cl. D9-245.000.
Roccaforte, Harry I., 255,991, Cl. D9-245.000.
Roccaforte, Harry I., 255,994, Cl. D9-245.000.

Chang, Ta-Peng; and Pritchard, Lois B., to Lever Brothers Company. Bottle or similar article. 255,986, 7-22-80, Cl. D9-64.000.

Chiarella, Philip V., to Les Produits Sportifs Micron Inc. - Micron Sports Products Inc. Figure skate boot. 255,955, 7-22-80, Cl. D2-275.000.

Chillog, Gerald M. Pallet. 256,007, 7-22-80, Cl. D12-53.000.

Chromcraft Corporation: *See*—
Wilson, Robert L., 255,962, Cl. D6-69.000.

Colgate-Palmolive Company: *See*—
Seelig, Barry G.; and Lee, Robert E., 255,985, Cl. D9-61.000.

Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., to Instructo/McGraw-Hill, Inc. Stage for transparency projection. 256,023, 7-22-80, Cl. D16-26.000.

Continental Group, Inc., The: *See*—
Mascia, Carmen T.; and Hasegawa, Gary K., 255,988, Cl. D9-83.000.

Cornelius Company, The: *See*—
Swanson, Craig A., 256,020, Cl. D15-112.000.

Creative Playgrounds Corporation: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 256,039, Cl. D21-244.000.

Csoka, Frank S., to Fun Things, Inc. Desk game puzzle. 256,037, 7-22-80, Cl. D21-104.000.

Cuccio, John; and Bell, Mace H., Jr., to Budd Company, The. Railway car body. 256,006, 7-22-80, Cl. D12-40.000.

Culbertson, Richard, to General Electric Company. Combined cassette tape player and radio. 256,013, 7-22-80, Cl. D14-5.000.

Curran, Mike H. Reflector assembly. 256,001, 7-22-80, Cl. D10-111.000.

Dansk International Designs Ltd.: *See*—
Andersen, Niels R., 255,967, Cl. D7-9.000.

De Vaughn, Donald H., to Bio-Plas. Pipette tip. 256,052, 7-22-80, Cl. D24-55.000.
Dieter, Berthold B.; and Gibson, Charles L., to Creative Playgrounds Corporation. Playground structure. 256,039, 7-22-80, Cl. D21-244.000.
Doherty, Glenn F., to Epicure Products, Inc. Loudspeaker mounting bracket. 256,015, 7-22-80, Cl. D14-37.000.
Doi, Tetsuyuki; and Sakamoto, Masakazu, to Ryobi Limited. Fishing spinning reel body or the like. 256,043, 7-22-80, Cl. D22-25.000.
Dulude, Charles R. Gun target. 256,041, 7-22-80, Cl. D22-15.000.
Emundts, Horst; and Kramer, Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Tractor. 256,017, 7-22-80, Cl. D15-23.000.
Epicure Products, Inc.: *See*—
Doherty, Glenn F., 256,015, Cl. D14-37.000.
Ethyl Development Corporation: *See*—
Kinslow, William G., 255,995, Cl. D9-275.000.
Ettinger, Melvyn: *See*—
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 256,023, Cl. D16-26.000.
Federal Signal Corporation: *See*—
Price, Owen G., 256,002, Cl. D10-121.000.
Finnieston, Alan. Wrist immobilizer. 256,054, 7-22-80, Cl. D24-64.000.
Finnieston, Alan. Wrist and hand zone immobilizer. 256,055, 7-22-80, Cl. D24-64.000.
Foote, Lorraine D. Cast boot or the like. 255,954, 7-22-80, Cl. D2-264.000.
France Bed Co., Ltd.: *See*—
Masuda, Teruo, 255,975, Cl. D7-160.000.
Franek, Wayne J.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Franek, Wayne J., 256,019, Cl. D15-105.000.
Freeman, Ellena M. E. Medallion or similar article. 256,004, 7-22-80, Cl. D11-110.000.
Fry, William L., to Lucas Industries Limited. Terminal connector cover. 256,010, 7-22-80, Cl. D13-24.000.
Fu, Hon Y.; Hin, Hon Y.; and Wing, Hon Y. Ball game trackway. 256,036, 7-22-80, Cl. D21-92.000.
Fun Things, Inc.: *See*—
Csoka, Frank S., 256,037, Cl. D21-104.000.
G E P: *See*—
Pasquier, Joseph, 255,957, Cl. D2-320.000.
Gates, John S.; and Randall, James E., to Lin-N-Look Company, Inc. Disposable cap. 255,953, 7-22-80, Cl. D2-254.000.
General Electric Company: *See*—
Culbertson, Richard, 256,013, Cl. D14-5.000.
Gentili, Giovanni, to Panigal S.p.A. - Saponerie Italiane Conserve Pecori S.p.A. Bottle. 255,987, 7-22-80, Cl. D9-71.000.
Germann, Albert R. Fan bracket. 255,982, 7-22-80, Cl. D8-366.000.
Gibson, Charles L.: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 256,039, Cl. D21-244.000.
Gillette Company, The: *See*—
Kozlowski, Edward C.; and Campbell, John D., 255,984, Cl. D9-1.000.
Lucas, Michael P., 255,990, Cl. D9-147.000.
Poisson, Norman D., 256,059, Cl. D28-46.000.
Goldstone, Milton, to H. W. Gossard Co., The. Garment. 255,952, 7-22-80, Cl. D2-183.000.
Gottschalk, Willis J. Building. 256,056, 7-22-80, Cl. D25-9.000.
Grethey, Albert K.: *See*—
Moore, Walter E.; and Grethey, Albert K., 256,031, Cl. D20-4.000.
H. W. Gossard Co., The: *See*—
Goldstone, Milton, 255,952, Cl. D2-183.000.
Hampshire, James F.; Terek, Greg P.; and Sankovich, Richard C., to Rubbermaid Commercial Products Inc. Hinged top card file. 256,029, 7-22-80, Cl. D19-76.000.
Hardison, Mary D. Hospital garment. 256,051, 7-22-80, Cl. D24-50.000.
Hasegawa, Gary K.: *See*—
Mascia, Carmen T.; and Hasegawa, Gary K., 255,988, Cl. D9-83.000.
Hin, Hon Y.: *See*—
Fu, Hon Y.; Hin, Hon Y.; and Wing, Hon Y., 256,036, Cl. D21-92.000.
Hirsch, Ira J. Sports shoe. 255,956, 7-22-80, Cl. D2-309.000.
Holleman, Howard A., to Hydro Tube Corporation. Blow-through fireplace poker. 255,977, 7-22-80, Cl. D7-210.000.
Hydro Tube Corporation: *See*—
Holleman, Howard A., 255,977, Cl. D7-210.000.
Ichikawa, Matsuo, to Ichikawa Press Industries Co., Ltd. Fog light. 256,057, 7-22-80, Cl. D26-29.000.
Ichikawa Press Industries Co., Ltd.: *See*—
Ichikawa, Matsuo, 256,057, Cl. D26-29.000.
Instructo/McGraw-Hill, Inc.: *See*—
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 256,023, Cl. D16-26.000.
Iwata Electric Co., Ltd.: *See*—
Iwata, Keisuke, 256,016, Cl. D14-95.000.
Iwata, Keisuke, to Iwata Electric Co., Ltd. Radio transmitter. 256,016, 7-22-80, Cl. D14-95.000.
Jacoby, Charles E. Detachable finger guard for a knife blade. 255,974, 7-22-80, Cl. D7-152.000.
Jansson, Sixten. Expandable element for holding a workpiece to be tooled. 256,021, 7-22-80, Cl. D15-140.000.
Joachim, Charlotte D.; March, Alvin C.; and Ratliff, Kay S., to Procter & Gamble Company, The. Nonwoven sheet material or the like. 256,062, 7-22-80, Cl. D92-1.00P.
Johnson, Allan B.: *See*—
Mackay, Spencer L.; Mackay, Frederick G.; and Johnson, Allan B., 256,027, Cl. D18-6.000.
Kelly, Roger L., to American Home Products Corporation. Turner or the like. 255,971, 7-22-80, Cl. D7-102.000.
Kendall Company, The: *See*—
Steigerwald, Carl J., 256,053, Cl. D24-56.000.
Kerr, Charles F. Holder for individual jelly cups. 255,961, 7-22-80, Cl. D6-28.000.
Kinslow, William G., to Ethyl Development Corporation. Dispensing closure. 255,995, 7-22-80, Cl. D9-275.000.
Kitson, Gerald L. Poultry cage egg ramp. 256,060, 7-22-80, Cl. D30-2.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Emundts, Horst; and Kramer, Peter, 256,017, Cl. D15-23.000.
Kozlowski, Edward C.; and Campbell, John D., to Gillette Company, The. Bottle. 255,984, 7-22-80, Cl. D9-1.000.
Kramer, Peter: *See*—
Emundts, Horst; and Kramer, Peter, 256,017, Cl. D15-23.000.
Kutschmende, Ralph. Illuminated sign. 256,032, 7-22-80, Cl. D20-10.000.
Lackmann, Bonnie K. Pan. 255,970, 7-22-80, Cl. D7-97.000.
Lagess Corp.: *See*—
Saint Ive, Michael H., 256,033, Cl. D21-34.000.
Lambert, Herbert L., to Champion International Corporation. Slide top carton blank or similar article. 255,993, 7-22-80, Cl. D9-245.000.
Lawrence, William J.; and Nesbitt, Richard R., to Texas Instruments Incorporated. Case for an electronic learning aid, game or similar apparatus. 256,028, 7-22-80, Cl. D19-60.000.
Leabrooke Manufacturing Inc.: *See*—
Lipsz, Frank F., 255,989, Cl. D9-131.000.
Lee, Robert E.: *See*—
Seelig, Barry G.; and Lee, Robert E., 255,985, Cl. D9-61.000.
Les Produits Sportifs Micron Inc. - Micron Sports Products Inc.: *See*—
Chiarella, Philip V., 255,955, Cl. D2-275.000.
Lever Brothers Company: *See*—
Chang, Ta-Peng; and Pritchard, Lois B., 255,986, Cl. D9-64.000.
Lewis, Shari, to SLS Entertainment Enterprises, Inc. Spectacle frame eye piece. 256,025, 7-22-80, Cl. D16-78.000.
Lighting Systems: *See*—
Zelina, Thomas, 256,061, Cl. D26-46.000.
Lin-N-Look Company, Inc.: *See*—
Gates, John S.; and Randall, James E., 255,953, Cl. D2-254.000.
Lipsz, Frank F., to Leabrooke Manufacturing Inc. Combined bottle and cap. 255,989, 7-22-80, Cl. D9-131.000.
Lockhart, Robert L. Scooter or similar article. 256,035, 7-22-80, Cl. D21-81.000.
Lucas Industries Limited: *See*—
Fry, William L., 256,010, Cl. D13-24.000.
Lucas, Michael P., to Gillette Company, The. Combined bottle and cap. 255,990, 7-22-80, Cl. D9-147.000.
Mackay, Frederick G.: *See*—
Mackay, Spencer L.; Mackay, Frederick G.; and Johnson, Allan B., 256,027, Cl. D18-6.000.
Mackay, Spencer L.; Mackay, Frederick G.; and Johnson, Allan B., to Teledyne Industries, Inc. Combination counter and tabulator for controlling food intake. 256,027, 7-22-80, Cl. D18-6.000.
Maeda, Hisashi, to Omron Tateishi Electronics Co. Electronic thermometer. 255,997, 7-22-80, Cl. D10-57.000.
March, Alvin C.: *See*—
Joachim, Charlotte D.; March, Alvin C.; and Ratliff, Kay S., 256,062, Cl. D92-1.00P.
Mascia, Carmen T.; and Hasegawa, Gary K., to Continental Group, Inc., The. Beverage container. 255,988, 7-22-80, Cl. D9-83.000.
Massey-Ferguson Inc.,: *See*—
Stone, Lawrence J.; and Wells, Richard J., 256,018, Cl. D15-28.000.
Masuda, Teruo, to France Bed Co., Ltd. Kneading blade for a food machine. 255,975, 7-22-80, Cl. D7-160.000.
Matsuda, Takehiko, to Toyostar Corporation. Light-intensity control contact switch or the like. 256,011, 7-22-80, Cl. D13-38.000.
Matsuda, Takehiko, to Toyostar Corporation. Light-intensity control contact switch or the like. 256,012, 7-22-80, Cl. D13-38.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Mori, Daisaku; Takahashi, Yoichi; and Takahashi, Hanji, 255,972, Cl. D7-128.000.
Maza, Dale T.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Downward pressure mop wringer. 255,976, 7-22-80, Cl. D7-187.000.
McCracken, Adrian B. Guitar. 256,026, 7-22-80, Cl. D17-14.000.
Mendenhall, Daniel C. Ski rack for an automobile or the like. 256,009, 7-22-80, Cl. D12-157.000.
Menin, Jean, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes. Tire. 256,008, 7-22-80, Cl. D12-147.000.
Merchant, H. Jackson, to Brown & Sharpe Manufacturing Company. Caliper. 255,998, 7-22-80, Cl. D10-73.000.
Mitchell, Bruce D. Convertible chair. 255,959, 7-22-80, Cl. D6-3.000.
Mobil Oil AB Sweden: *See*—
Molijn, Sture G., 255,999, Cl. D10-96.000.
Molijn, Sture G., 256,000, Cl. D10-96.000.
Molijn, Sture G., to Mobil Oil AB Sweden. Fluid flow indicator. 255,999, 7-22-80, Cl. D10-96.000.
Molijn, Sture G., to Mobil Oil AB Sweden. Fluid flow indicator. 256,000, 7-22-80, Cl. D10-96.000.
Moore, Walter E.; and Grethey, Albert K., to UMC Industries, Inc. Vending machine. 256,031, 7-22-80, Cl. D20-4.000.

Mori, Daisaku; Takahashi, Yoichi; and Takahashi, Hanji, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 255,972, 7-22-80, Cl. D7-128.000.
Morin, Andre. Spoon. 255,973, 7-22-80, Cl. D7-138.000.
Morrison, Thurber H.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Franek, Wayne J., 256,019, Cl. D15-105.000.
National Presto Industries, Inc.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Franek, Wayne J., 256,019, Cl. D15-105.000.
Nesbitt, Richard R.: *See*—
Lawrence, William J.; and Nesbitt, Richard R., 256,028, Cl. D19-60.000.
Nilles, John D.; and Stankiewicz, Stanley L., to American Hospital Supply Corporation. Dental handpiece. 256,050, 7-22-80, Cl. D24-12.000.
Nippon Kogaku K.K.: *See*—
Noda, Seijiro; and Suyama, Hitoshi, 256,024, Cl. D16-59.000.
Noda, Seijiro; and Suyama, Hitoshi, to Nippon Kogaku K.K. Binoculars. 256,024, 7-22-80, Cl. D16-59.000.
Noga, Robert A. Vehicle speaker. 256,014, 7-22-80, Cl. D14-33.000.
O'Connor, David A., to Virginia National Bankshares, Inc. Support for use with electronic computer units. 255,965, 7-22-80, Cl. D6-191.000.
Omron Tateishi Electronics Co.: *See*—
Maeda, Hisashi, 255,997, Cl. D10-57.000.
Panigal S.p.A. - Saponerie Italiane Conserve Pecori S.p.A.: *See*—
Gentili, Giovanni, 255,987, Cl. D9-71.000.
Pasquier, Joseph, to G E P. Athletic shoe sole. 255,957, 7-22-80, Cl. D2-320.000.
Perrin, Duane O. Pipe clamp seal. 256,046, 7-22-80, Cl. D23-47.000.
Philips, Nicholas A. Fishing lure. 256,045, 7-22-80, Cl. D22-28.000.
Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See*—
Menin, Jean, 256,008, Cl. D12-147.000.
Poisson, Norman D., to Gillette Company, The. Razor. 256,059, 7-22-80, Cl. D28-46.000.
Presser, Dwight W. Water ski tow handle. 256,038, 7-22-80, Cl. D21-230.000.
Price, Owen G., to Federal Signal Corporation. Horn grille. 256,002, 7-22-80, Cl. D10-121.000.
Pritchard, Lois B.: *See*—
Chang, Ta-Peng; and Pritchard, Lois B., 255,986, Cl. D9-64.000.
Procter & Gamble Company, The: *See*—
Burg, Klaus, 256,063, Cl. D92-1.00P.
Joachim, Charlotte D.; March, Alvin C.; and Ratliff, Kay S., 256,062, Cl. D92-1.00P.
Randall, James E.: *See*—
Gates, John S.; and Randall, James E., 255,953, Cl. D2-254.000.
Ratliff, Kay S.: *See*—
Joachim, Charlotte D.; March, Alvin C.; and Ratliff, Kay S., 256,062, Cl. D92-1.00P.
Recreation Systems Co.: *See*—
Beller, Frank W., 256,040, Cl. D21-245.000.
Roccaforte, Harry I., to Champion International Corporation. Flip top dispenser box blank. 255,991, 7-22-80, Cl. D9-245.000.
Roccaforte, Harry I., to Champion International Corporation. Blank for a foldable carton. 255,994, 7-22-80, Cl. D9-245.000.
Rod Pierce & Associates: *See*—
Youngkin, Theodore C.; and Stutsman, Richard R., 256,030, Cl. D20-4.000.
Rubbermaid Commercial Products Inc.: *See*—
Hampshire, James F.; Terek, Greg P.; and Sankovich, Richard C., 256,029, Cl. D19-76.000.
Maza, Dale T.; and Terek, Greg P., 255,976, Cl. D7-187.000.
Rubin, Harry S.: *See*—
Constantine, Paul; Ettinger, Melvyn; and Rubin, Harry S., 256,023, Cl. D16-26.000.
Ryder International Corporation: *See*—
Thomas, Michael D., 256,049, Cl. D24-9.000.
Ryobi Limited: *See*—
Doi, Tetsuyuki; and Sakamoto, Masakazu, 256,043, Cl. D22-25.000.
Saint Ive, Michael H., to Lagess Corp. Game board. 256,033, 7-22-80, Cl. D21-34.000.
Sakamoto, Masakazu: *See*—
Doi, Tetsuyuki; and Sakamoto, Masakazu, 256,043, Cl. D22-25.000.
Sankovich, Richard C.: *See*—
Hampshire, James F.; Terek, Greg P.; and Sankovich, Richard C., 256,029, Cl. D19-76.000.
Sea-Land Service, Inc.: *See*—
Armstrong, George W.; and Aronson, Eric G., 255,983, Cl. D8-382.000.
Sedillo, Michael J. Cradle or similar article. 255,960, 7-22-80, Cl. D6-15.000.
Seelig, Barry G.; and Lee, Robert E., to Colgate-Palmolive Company. Bottle. 255,985, 7-22-80, Cl. D9-61.000.
Shack, David A. Compartmented serving tray. 255,968, 7-22-80, Cl. D7-38.000.
Shimodaira, Katsuhiko. Handle for a fishing rod. 256,042, 7-22-80, Cl. D22-23.000.
Shulman, Michael H. Wrapping apparatus for palletized loads. 256,022, 7-22-80, Cl. D15-145.000.
SLS Entertainment Enterprises, Inc.: *See*—
Lewis, Shari, 256,025, Cl. D16-78.000.
Stadel, Myrtle. Inflatable recreational cushion. 255,966, 7-22-80, Cl. D6-201.000.
Stankiewicz, Stanley L.: *See*—
Nilles, John D.; and Stankiewicz, Stanley L., 256,050, Cl. D24-12.000.
Steigerwald, Carl J., to Kendall Company, The. Specimen device. 256,053, 7-22-80, Cl. D24-56.000.
Steinkamp, Norman A., to Sunbeam Corporation. Juice extractor attachment for a mixer. 255,969, 7-22-80, Cl. D7-48.000.
Stone, Lawrence J.; and Wells, Richard J., to Massey-Ferguson Inc.,. Tractor console. 256,018, 7-22-80, Cl. D15-28.000.
Storm Plastics, Inc.: *See*—
Storm, William D., 256,044, Cl. D22-28.000.
Storm, William D., to Storm Plastics, Inc. Fishing lure. 256,044, 7-22-80, Cl. D22-28.000.
Stutsman, Richard R.: *See*—
Youngkin, Theodore C.; and Stutsman, Richard R., 256,030, Cl. D20-4.000.
Sunbeam Corporation: *See*—
Steinkamp, Norman A., 255,969, Cl. D7-48.000.
Suyama, Hitoshi: *See*—
Noda, Seijiro; and Suyama, Hitoshi, 256,024, Cl. D16-59.000.
Swanson, Craig A., to Cornelius Company, The. Beverage dispenser. 256,020, 7-22-80, Cl. D15-112.000.
Takahashi, Hanji: *See*—
Mori, Daisaku; Takahashi, Yoichi; and Takahashi, Hanji, 255,972, Cl. D7-128.000.
Takahashi, Yoichi: *See*—
Mori, Daisaku; Takahashi, Yoichi; and Takahashi, Hanji, 255,972, Cl. D7-128.000.
Tamura Electric Works, Ltd.: *See*—
Tamura, Shuichi, 255,996, Cl. D10-15.000.
Tamura, Shuichi, to Tamura Electric Works, Ltd. Pocketable watch. 255,996, 7-22-80, Cl. D10-15.000.
Teledyne Industries, Inc.: *See*—
Mackay, Spencer L.; Mackay, Frederick G.; and Johnson, Allan B., 256,027, Cl. D18-6.000.
Terek, Greg P.: *See*—
Hampshire, James F.; Terek, Greg P.; and Sankovich, Richard C., 256,029, Cl. D19-76.000.
Maza, Dale T.; and Terek, Greg P., 255,976, Cl. D7-187.000.
Texas Instruments Incorporated: *See*—
Lawrence, William J.; and Nesbitt, Richard R., 256,028, Cl. D19-60.000.
Thomas, Michael D., to Ryder International Corporation. Sterilizer unit. 256,049, 7-22-80, Cl. D24-9.000.
Toyostar Corporation: *See*—
Matsuda, Takehiko, 256,011, Cl. D13-38.000.
Matsuda, Takehiko, 256,012, Cl. D13-38.000.
UMC Industries, Inc.: *See*—
Moore, Walter E.; and Grethey, Albert K., 256,031, Cl. D20-4.000.
Virginia National Bankshares, Inc.: *See*—
O'Connor, David A., 255,965, Cl. D6-191.000.
Wells, Richard J.: *See*—
Stone, Lawrence J.; and Wells, Richard J., 256,018, Cl. D15-28.000.
Wilson, Robert L., to Chromcraft Corporation. Chair. 255,962, 7-22-80, Cl. D6-69.000.
Wing, Hon Y.: *See*—
Fu, Hon Y.; Hin, Hon Y.; and Wing, Hon Y., 256,036, Cl. D21-92.000.
Winget, Quenton F. Angle snips. 255,980, 7-22-80, Cl. D8-52.000.
Wormington, Garold L. Heat exchanger. 256,047, 7-22-80, Cl. D23-115.000.
Yedinak, Theodore: *See*—
Anderson, Bernard T.; and Yedinak, Theodore, 255,964, Cl. D6-181.000.
Youngkin, Theodore C.; and Stutsman, Richard R., to Rod Pierce & Associates. Vending machine. 256,030, 7-22-80, Cl. D20-4.000.
Zelina, Thomas, to Lighting Systems. Combined portable spot/flood light. 256,061, 7-22-80, Cl. D26-46.000.

# CLASSIFICATION OF PATENTS

## ISSUED JULY 22, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

### CLASS 2

| | |
|---|---|
| 2 | 4,213,202 |
| 79 | 4,213,203 |
| 94 | 4,213,204 |
| 161 A | 4,213,205 |
| 197 | 4,213,206 |

### CLASS 3

| | |
|---|---|
| 1.7 | 4,213,207 |
| 1.91 | 4,213,208 |
| 1.911 | 4,213,209 |

### CLASS 4

| | |
|---|---|
| 239 | 4,213,211 |
| 243 | 4,213,212 |
| 543 | 4,213,210 |

### CLASS 5

| | |
|---|---|
| 450 | 4,213,213 |
| 464 | 4,213,214 |

### CLASS 7

| | |
|---|---|
| 152 | 4,213,215 |
| 170 | 4,213,216 |

### CLASS 8

| | |
|---|---|
| 94.17 | 4,213,760 |
| 125 | 4,213,761 |
| 151 | 4,213,217 |
| | 4,213,218 |
| 409 | 4,213,758 |
| 518 | 4,213,757 |
| 643 | 4,213,759 |

### CLASS 9

| | |
|---|---|
| 4 R | 4,213,219 |

### CLASS 11

| | |
|---|---|
| 1 R | 4,213,220 |

### CLASS 12

| | |
|---|---|
| 12.4 | 4,213,221 |

### CLASS 13

| | |
|---|---|
| 31 R | 4,214,117 |

### CLASS 15

| | |
|---|---|
| 100 | 4,213,222 |
| 304 | 4,213,223 |
| 344 | 4,213,224 |

### CLASS 16

| | |
|---|---|
| 21 | 4,213,225 |
| 36 | 4,213,226 |
| 48.5 | 4,213,227 |

### CLASS 17

| | |
|---|---|
| 11 | 4,213,228 |
| 46 | 4,213,229 |

### CLASS 23

| | |
|---|---|
| 230 B | 4,213,764 |
| 230 EP | 4,213,763 |
| 230 R | 4,213,762 |

### CLASS 24

| | |
|---|---|
| 217 R | 4,213,230 |

### CLASS 29

| | |
|---|---|
| 18 | 4,213,231 |
| 116 AD | 4,213,232 |
| 157.1 R | 4,213,233 |
| 159.1 | 4,213,234 |
| 235 | 4,213,235 |
| 243.5 | 4,213,236 |
| 272 | 4,213,237 |
| 726 | 4,213,239 |
| 878 | 4,213,238 |

### CLASS 30

| | |
|---|---|
| 47 | 4,213,240 |
| 115 | 4,213,241 |
| 374 | 4,213,242 |

### CLASS 33

| | |
|---|---|
| 1 M | 4,213,244 |
| 174 P | 4,213,245 |
| 178 F | 4,213,246 |
| 199 R | 4,213,247 |
| 431 | 4,213,248 |

### CLASS 34

| | |
|---|---|
| 12 | 4,213,249 |
| 53 | 4,213,250 |

### CLASS 35

| | |
|---|---|
| 9 R | 4,213,251 |
| 10.24 | 4,213,252 |
| 19 A | 4,213,253 |
| 43 | 4,213,254 |

### CLASS 36

| | |
|---|---|
| 32 R | 4,213,255 |
| 124 | 4,213,256 |

### CLASS 37

| | |
|---|---|
| 142 R | 4,213,257 |

### CLASS 38

| | |
|---|---|
| 77.2 | 4,213,258 |

### CLASS 40

| | |
|---|---|
| 152.1 | 4,213,259 |
| 158 B | 4,213,260 |

### CLASS 42

| | |
|---|---|
| 16 | 4,213,261 |
| 50 | 4,213,262 |
| 59 | 4,213,263 |

### CLASS 43

| | |
|---|---|
| 16 | 4,213,264 |
| 84 | 4,213,265 |

### CLASS 44

| | |
|---|---|
| 15 R | 4,213,765 |

### CLASS 46

| | |
|---|---|
| 1 R | 4,213,266 |
| 87 | 4,213,267 |
| 202 | 4,213,268 |
| 219 | 4,213,269 |
| 254 | 4,213,270 |

### CLASS 47

| | |
|---|---|
| 39 | 4,213,271 |
| 45 | 4,213,272 |
| 74 | 4,213,273 |
| 81 | 4,213,274 |

### CLASS 49

| | |
|---|---|
| 468 | 4,213,275 |

### CLASS 51

| | |
|---|---|
| 170 R | 4,213,276 |
| 325 | 4,213,277 |
| 368 | 4,213,278 |

### CLASS 52

| | |
|---|---|
| 173 DS | 4,213,279 |
| 309.9 | 4,213,280 |
| 323 | 4,213,281 |
| 404 | 4,213,282 |

### CLASS 53

| | |
|---|---|
| 48 | 4,213,283 |
| 74 | 4,213,284 |
| 137 | 4,213,285 |
| 493 | 4,213,286 |
| 573 | 4,213,287 |

### CLASS 55

| | |
|---|---|
| 2 | 4,213,766 |
| 5 | 4,213,767 |
| 97 | 4,213,768 |
| 216 | 4,213,769 |
| 269 | 4,213,770 |
| 483 | 4,213,771 |

### CLASS 56

| | |
|---|---|
| 11.6 | 4,213,288 |
| 295 | 4,213,289 |

### CLASS 57

| | |
|---|---|
| 85 | 4,213,290 |

### CLASS 60

| | |
|---|---|
| 39.14 R | 4,213,296 |
| 39.51 R | 4,213,297 |
| 369 | 4,213,298 |
| 407 | 4,213,301 |
| 420 | 4,213,300 |
| 641 | 4,213,302 |
| | 4,213,303 |
| 664 | 4,213,304 |
| 676 | 4,213,299 |

### CLASS 62

| | |
|---|---|
| 2 | 4,213,305 |
| 85 | 4,213,306 |
| 192 | 4,213,307 |
| 196 R | 4,213,308 |
| 332 | 4,213,309 |
| 457 | 4,213,310 |
| 514 R | 4,213,311 |

### CLASS 65

| | |
|---|---|
| 30 R | 4,213,772 |

### CLASS 66

| | |
|---|---|
| 177 | 4,213,312 |

### CLASS 68

| | |
|---|---|
| 12 R | 4,213,313 |

### CLASS 70

| | |
|---|---|
| 35 B | 4,213,316 |
| 68 | 4,213,314 |
| 94 | 4,213,315 |
| 450 | 4,213,317 |

### CLASS 71

| | |
|---|---|
| 92 | 4,213,773 |
| 94 | 4,213,774 |
| 103 | 4,213,775 |
| 117 | 4,213,776 |

### CLASS 72

| | |
|---|---|
| 21 | 4,213,318 |
| 34 | 4,213,319 |
| 189 | 4,213,320 |
| 235 | 4,213,321 |
| 357 | 4,213,322 |
| 358 | 4,213,323 |
| 405 | 4,213,324 |

### CLASS 73

| | |
|---|---|
| 1 G | 4,213,325 |
| 23.1 | 4,213,326 |
| 38 | 4,213,327 |
| 49.7 | 4,213,328 |
| 52 | 4,213,329 |
| 65 | 4,213,330 |
| 105 | 4,213,331 |
| 134 | 4,213,332 |
| 136 R | 4,213,333 |
| 144 | 4,213,334 |
| 204 | 4,213,335 |
| 215 | 4,213,336 |
| 290 V | 4,213,337 |
| 299 | 4,213,338 |
| 304 R | 4,213,339 |
| | 4,213,340 |
| 421 A | 4,213,341 |
| 421 B | 4,213,342 |
| 505 | 4,213,343 |
| 620 | 4,213,344 |
| 637 | 4,213,345 |
| 660 | 4,213,346 |
| 716 | 4,213,347 |
| 765 | 4,213,348 |
| 847 | 4,213,349 |

### CLASS 74

| | |
|---|---|
| 492 | 4,213,351 |
| 677 | 4,213,352 |
| 878 | 4,213,353 |

### CLASS 75

| | |
|---|---|
| 0.5 BA | 4,213,777 |
| 25 | 4,213,778 |
| 34 | 4,213,779 |
| 58 | 4,213,780 |
| 134 P | 4,213,781 |

### CLASS 81

| | |
|---|---|
| 9.5 B | Re.30,342 |
| 128 | 4,213,355 |

### CLASS 82

| | |
|---|---|
| 1 C | 4,213,354 |
| 2 B | 4,213,356 |
| 4 C | 4,213,357 |
| 36 R | 4,213,358 |
| 47 | 4,213,359 |

### CLASS 83

| | |
|---|---|
| 15 | 4,213,360 |
| 30 | 4,213,361 |
| 100 | 4,213,362 |
| 298 | 4,213,363 |
| 471.3 | 4,213,364 |
| 530 | 4,213,365 |

### CLASS 84

| | |
|---|---|
| 1.01 | 4,213,366 |
| 1.22 | 4,213,367 |
| 269 | 4,213,368 |
| 284 | 4,213,369 |
| 291 | 4,213,370 |
| 390 | 4,213,371 |
| 470 R | 4,213,372 |

### CLASS 85

| | |
|---|---|
| 11 | 4,213,373 |
| 13 | 4,213,374 |

### CLASS 89

| | |
|---|---|
| 31 | 4,213,375 |
| 34 | 4,213,376 |

### CLASS 91

| | |
|---|---|
| 187 | 4,213,377 |

### CLASS 93

| | |
|---|---|
| 36 A | 4,213,378 |

### CLASS 98

| | |
|---|---|
| 33 R | 4,213,379 |

### CLASS 99

| | |
|---|---|
| 349 | 4,213,380 |
| 446 | 4,213,381 |
| 486 | 4,213,382 |
| 636 | 4,213,383 |

### CLASS 100

| | |
|---|---|
| 74 | 4,213,384 |
| 95 | 4,213,385 |
| 98 R | 4,213,386 |
| 245 | 4,213,387 |

### CLASS 101

| | |
|---|---|
| 216 | 4,213,388 |
| 295 | 4,213,389 |
| 365 | 4,213,390 |

### CLASS 102

| | |
|---|---|
| 8 | 4,213,391 |
| 38 R | 4,213,392 |
| 49.3 | 4,213,393 |
| 213 | 4,213,394 |
| 236 | 4,213,395 |

### CLASS 104

| | |
|---|---|
| 130 | 4,213,396 |

### CLASS 105

| | |
|---|---|
| 95 | 4,213,397 |
| 150 | 4,213,398 |
| 157 R | 4,213,399 |
| 199 C | 4,213,400 |

### CLASS 106

| | |
|---|---|
| 38.35 | 4,213,785 |
| 47 Q | 4,213,786 |
| | 4,213,787 |
| | 4,213,788 |
| 52 | 4,213,789 |
| 100 | 4,213,790 |
| | 4,213,791 |
| 286.6 | 4,213,792 |
| 286.8 | 4,213,793 |

### CLASS 108

| | |
|---|---|
| 20 | 4,213,401 |

### CLASS 110

| | |
|---|---|
| 171 | 4,213,402 |
| 216 | 4,213,403 |
| 229 | 4,213,404 |
| 234 | 4,213,405 |
| 326 | 4,213,406 |
| 346 | 4,213,407 |

### CLASS 111

| | |
|---|---|
| 85 | 4,213,408 |

### CLASS 112

| | |
|---|---|
| 158 R | 4,213,409 |
| 228 | 4,213,410 |
| 240 | 4,213,411 |

### CLASS 114

| | |
|---|---|
| 61 | 4,213,412 |
| 253 | 4,213,413 |

### CLASS 115

| | |
|---|---|
| 73 | 4,213,414 |

### CLASS 116

| | |
|---|---|
| 28.1 | 4,213,415 |
| 309 | 4,213,416 |

### CLASS 118

| | |
|---|---|
| 30 | 4,213,417 |
| 635 | 4,213,418 |
| 670 | 4,213,419 |
| 713 | 4,213,420 |

### CLASS 119

| | |
|---|---|
| 3 | 4,213,421 |
| 21 | 4,213,422 |
| 86 | 4,213,423 |
| 98 | 4,213,424 |

### CLASS 123

| | |
|---|---|
| 41.49 | 4,213,426 |
| 43 AA | 4,213,427 |
| 46 E | 4,213,428 |
| 73 R | 4,213,431 |
| 179 A | 4,213,437 |
| 195 C | 4,213,440 |
| 195 S | 4,213,439 |
| 196 R | 4,213,441 |
| 198 F | 4,213,442 |
| 414 | 4,213,429 |
| 440 | 4,213,430 |
| 446 | 4,213,435 |
| 462 | 4,213,434 |
| 478 | 4,213,425 |
| 549 | 4,213,432 |
| | 4,213,433 |
| 599 | 4,213,436 |
| 668 | 4,213,438 |

### CLASS 126

| | |
|---|---|
| 72 | 4,213,443 |
| 130 | 4,213,444 |
| 143 | 4,213,445 |
| 192 | 4,213,446 |
| 429 | 4,213,447 |
| 434 | 4,213,448 |
| 447 | 4,213,449 |
| 448 | 4,213,450 |

### CLASS 128

| | |
|---|---|
| 12 | 4,213,451 |
| 89 R | 4,213,452 |
| 202.26 | 4,213,453 |
| 214 E | 4,213,454 |
| | 4,213,455 |
| 218 P | 4,213,456 |
| 276 | 4,213,457 |
| 283 | 4,213,458 |
| 287 | 4,213,459 |
| 303 R | 4,213,460 |
| 348 | 4,213,461 |
| 634 | 4,213,462 |
| 639 | 4,213,463 |
| 645 | 4,213,464 |
| 731 | 4,213,465 |
| 733 | 4,213,466 |
| | 4,213,467 |

### CLASS 131

| | |
|---|---|
| 145 | 4,213,468 |
| 199 | 4,213,469 |
| 261 B | 4,213,470 |

### CLASS 132

| | |
|---|---|
| 73.6 | 4,213,471 |
| 88.7 | 4,213,472 |
| 113 | 4,213,473 |

### CLASS 134

| | |
|---|---|
| 6 | 4,213,794 |
| 22 C | 4,213,795 |
| 26 | 4,213,796 |
| 102 | 4,213,474 |
| 111 | 4,213,475 |

### CLASS 136

| | |
|---|---|
| 89 SJ | 4,213,798 |
| 89 SP | 4,213,797 |

### CLASS 137

| | |
|---|---|
| 2 | 4,213,476 |
| 15 | 4,213,477 |
| 85 | 4,213,478 |
| 493 | 4,213,479 |
| 556 | 4,213,480 |
| 596.18 | 4,213,481 |
| 614.01 | 4,213,482 |
| 625.29 | 4,213,483 |
| 636.1 | 4,213,484 |

### CLASS 138

| | |
|---|---|
| 130 | 4,213,485 |
| 143 | 4,213,486 |
| 149 | 4,213,487 |

### CLASS 141

| | |
|---|---|
| 1 | 4,213,488 |
| 70 | 4,213,489 |
| 311 R | 4,213,490 |

### CLASS 148

| | |
|---|---|
| 2 | 4,213,799 |
| | 4,213,800 |
| 33.3 | 4,213,801 |
| 101 | 4,213,802 |
| 102 | 4,213,803 |
| 111 | 4,213,804 |
| 171 | 4,213,805 |
| 187 | 4,213,806 |
| | 4,213,807 |
| 188 | 4,213,808 |

### CLASS 149

| | |
|---|---|
| 60 | 4,213,809 |

### CLASS 152

| | |
|---|---|
| 330 L | 4,213,491 |

### CLASS 156

| | |
|---|---|
| 73.1 | 4,213,810 |
| 195 | 4,213,811 |
| 226 | 4,213,812 |
| | 4,213,813 |
| 242 | 4,213,814 |
| 244.11 | 4,213,815 |
| 245 | 4,213,816 |
| 474 | 4,213,817 |
| 643 | 4,213,818 |
| 660 | 4,213,819 |

### CLASS 160

| | |
|---|---|
| 124 | 4,213,492 |
| 351 | 4,213,493 |

### CLASS 162

| | |
|---|---|
| 29 | 4,213,820 |
| 72 | 4,213,821 |
| 242 | 4,213,822 |
| 380 | 4,213,823 |

### CLASS 164

| | |
|---|---|
| 4 | 4,213,494 |
| 34 | 4,213,495 |
| 60 | 4,213,497 |
| 147 | 4,213,496 |

### CLASS 165

| | |
|---|---|
| 136 | 4,213,498 |
| 162 | 4,213,499 |

### CLASS 166

| | |
|---|---|
| 273 | 4,213,500 |

### CLASS 169

| | |
|---|---|
| 46 | 4,213,501 |

### CLASS 172

| | |
|---|---|
| 1 | 4,213,502 |
| 4.5 | 4,213,503 |
| 25 | 4,213,504 |
| 510 | 4,213,505 |
| 624 | 4,213,506 |
| 784 | 4,213,507 |

### CLASS 174

| | |
|---|---|
| 15 BH | 4,214,118 |
| 31 R | 4,214,119 |
| 52 FP | 4,214,120 |
| 84 C | 4,214,121 |

### CLASS 175

| | |
|---|---|
| 235 | 4,213,508 |

### CLASS 176

| | |
|---|---|
| 38 | 4,213,824 |

### CLASS 177

| | |
|---|---|
| 199 | 4,213,509 |

### CLASS 178

| | |
|---|---|
| 18 | 4,214,122 |

**CLASS 179**

1 SM 4,214,125
1.5 M 4,214,126
2 R 4,214,127
81 R 4,214,130
84 T 4,214,131
175 4,214,132

**CLASS 180**

68.5 4,213,510
139 4,213,511
233 4,213,512
272 4,213,513
308 4,213,514

**CLASS 181**

145 4,213,515
286 4,213,516

**CLASS 187**

29 R 4,213,517

**CLASS 188**

1 B 4,213,518
71.4 4,213,519

**CLASS 190**

16 4,213,520

**CLASS 192**

18 R 4,213,521
98 4,213,522

**CLASS 193**

37 4,213,523

**CLASS 194**

2 4,213,524

**CLASS 198**

364 4,213,525
400 4,213,526
834 Re.30,341
853 4,213,527

**CLASS 200**

31 R 4,214,133
37 R 4,214,134
51.17 4,214,135
67 DA 4,214,136
83 P 4,214,137
144 B 4,214,138

**CLASS 201**

31 4,213,826
39 4,213,827
4,213,828

**CLASS 202**

263 4,213,829

**CLASS 203**

11 4,213,830
86 4,213,831
95 4,213,832

**CLASS 204**

98 4,213,833
129.25 4,213,834
4,213,835
157.1 R 4,213,836
159.19 4,213,837
176 4,213,838
181 R 4,213,839
192 C 4,213,840
195 R 4,213,841
279 4,213,842
290 F 4,213,843
298 4,213,844

**CLASS 206**

45.14 4,213,598
205 4,213,528
427 4,213,529
447 4,213,530
463 4,213,531
504 4,213,532

**CLASS 208**

19 4,213,845
50 4,213,846
111 4,213,847
127 4,213,848
139 4,213,849
216 R 4,213,850

**CLASS 209**

12 4,213,851
136 4,213,852
166 4,213,853
223 R 4,213,854
240 4,213,855
250 4,213,856
654 4,213,533

**CLASS 210**

6 4,213,857
23 R 4,213,858
27 4,213,859
31 C 4,213,860
82 4,213,861
83 4,213,862
108 4,213,863
151 4,213,864
522 4,213,865

**CLASS 215**

216 4,213,534

**CLASS 219**

9.5 4,214,139
61.3 4,214,140
73 4,214,141
86.25 4,214,142
97 4,214,143
99 4,214,144
145.22 4,214,145
274 4,214,146
301 4,214,147
308 4,214,148
370 4,214,149
452 4,214,150
492 4,214,151

**CLASS 220**

20.5 4,213,535
82 R 4,213,536
215 4,213,537
268 4,213,538
333 4,213,539

**CLASS 221**

150 R 4,213,540

**CLASS 222**

92 4,213,541
102 4,213,542
103 4,213,543
250 4,213,544
386.5 4,213,545
546 4,213,546
590 Re.30,343

**CLASS 223**

2 4,213,547

**CLASS 224**

168 4,213,548
209 4,213,549

**CLASS 225**

2 4,213,550

**CLASS 226**

74 4,213,551
170 4,213,552
196 4,213,553

**CLASS 228**

2 4,213,554
29 4,213,555
104 4,213,556
122 4,213,557
176 4,213,558

**CLASS 229**

16 D 4,213,559

**CLASS 232**

39 4,213,560

**CLASS 233**

14 R 4,213,561

**CLASS 235**

92 EC 4,214,152
376 4,214,153

**CLASS 236**

46 R 4,213,562

**CLASS 237**

2 B 4,213,563

**CLASS 239**

88 4,213,564
170 4,213,565
265.43 4,213,566
396 4,213,567
533.4 4,213,568

**CLASS 241**

37.5 4,213,569
38 4,213,570
48 4,213,571
292.1 4,213,572

**CLASS 242**

18 A 4,213,573
43.2 4,213,574
57 4,213,575
67.3 R 4,213,576
72 R 4,213,577
74 4,213,578
84.2 B 4,213,579
107 4,213,580
107.4 R 4,213,581
110 4,213,582
186 4,213,583

**CLASS 244**

17.13 4,213,584
54 4,213,585
158 4,213,586
213 4,213,587

**CLASS 246**

259 4,213,588

**CLASS 248**

74 R 4,213,589
281.1 4,213,591
313 4,213,592
501 4,213,593
550 4,213,594

**CLASS 250**

201 4,214,154
231 R 4,214,155
231 SE 4,214,156
236 4,214,157
281 4,214,158
288 4,214,159
292 4,214,160
303 4,214,161
311 4,214,162
4,214,163
338 4,214,164
4,214,165
396 ML 4,214,166
505 4,214,169
515 4,214,167

**CLASS 251**

308 4,213,595

**CLASS 252**

8.55 C 4,213,866
8.75 4,213,867
11 4,213,868
37.5 4,213,869
51.5 R 4,213,870
60 4,213,871
174.21 4,213,873
174.25 4,213,874
188.3 R 4,213,875
408 4,213,876
412 4,213,877
429 B 4,213,878
429 R 4,213,879
431 R 4,213,880
436 4,213,881
455 R 4,213,882
478 4,213,883

**CLASS 254**

134.3 R 4,213,596
388 4,213,597

**CLASS 260**

29.2 N 4,213,884
29.6 E 4,213,887
29.6 MM 4,213,886
29.6 TA 4,213,885
33.6 AQ 4,213,888
45.7 PH 4,213,889
45.75 S 4,213,891
45.75 W 4,213,890
45.95 C 4,213,892
112.5 R 4,213,893
4,213,894
4,213,895
119 4,213,896
154 4,213,897
156 4,213,898
4,213,899
208 4,213,900
239 BE 4,213,901
239.57 4,213,902
326.47 4,213,905
326.5 CA 4,213,904
343 4,213,906
343.3 P 4,213,907
348.16 4,213,908
371 4,213,909
4,213,910
397.1 4,213,911
4,213,912
428.5 4,213,913
455 A 4,213,915
465 D 4,213,916
4,213,917
513 T 4,213,918
544 K 4,213,919
958 4,213,922

**CLASS 261**

120 4,213,923

**CLASS 264**

7 4,213,924
22 4,213,925
74 4,213,926
107 4,213,927
113 4,213,928
129 4,213,929
135 4,213,930
234 4,213,931
236 4,213,932
515 4,213,933

**CLASS 266**

166 4,213,599
170 4,213,600

**CLASS 270**

61 F 4,213,601

**CLASS 271**

229 4,213,603
233 4,213,604
279 4,213,602

**CLASS 272**

65 Re.30,344
119 4,213,605

**CLASS 273**

1.5 A 4,213,606
72 A 4,213,607
73 C 4,213,608
75 4,213,609
93 R 4,213,610
169 4,213,613
194 B 4,213,614
260 4,213,615
271 4,213,616
355 4,213,612
414 4,213,611

**CLASS 277**

12 4,213,617
93 R 4,213,618
207 A 4,213,619
235 B 4,213,620

**CLASS 279**

1 C 4,213,621
4,213,623
1 K 4,213,622

**CLASS 280**

43.12 4,213,624
43.23 4,213,625
94 4,213,626
406 A 4,213,627
412 4,213,628
605 4,213,629
634 4,213,630
661 4,213,631
697 4,213,632
716 4,213,633
728 4,213,634
737 4,213,635
749 4,213,636
802 4,213,637
808 4,213,638

**CLASS 282**

11.5 A 4,213,639

**CLASS 285**

137 R 4,213,640
369 4,213,641

**CLASS 290**

1 R 4,214,170

**CLASS 292**

241 4,213,642
247 4,213,643

**CLASS 293**

117 4,213,644
145 4,213,645

**CLASS 294**

86 A 4,213,646
90 4,213,647

**CLASS 297**

188 4,213,648
189 4,213,649
281 4,213,650
475 4,213,651
478 4,213,652

**CLASS 299**

11 4,213,653

**CLASS 301**

20 4,213,654

**CLASS 303**

6 C 4,213,655

**CLASS 307**

39 4,214,171
150 4,214,172
224 C 4,214,173
229 4,214,174
264 4,214,175
297 4,214,176
355 4,214,177

**CLASS 308**

8.2 4,213,656
9 4,213,657
15 4,213,658
167 4,213,659
177 4,213,660
184 R 4,213,661

**CLASS 310**

14 4,214,178
68 B 4,214,179
80 4,214,180
162 4,214,181
216 4,214,182

**CLASS 313**

221 4,214,183
481 4,214,184

**CLASS 315**

86 4,214,185
102 4,214,186
111.8 4,214,187
382 4,214,188
408 4,214,189

**CLASS 316**

24 4,213,662
4,213,663

**CLASS 318**

356 4,214,190
561 4,214,191
573 4,214,192
611 4,214,193
696 4,214,194
745 4,214,195
811 4,214,196

**CLASS 320**

2 4,214,197
15 4,214,198

**CLASS 323**

6 4,214,199

**CLASS 324**

122 4,214,200
158 P 4,214,201
313 4,214,202
425 4,214,203
437 4,214,204

**CLASS 328**

117 4,214,213

**CLASS 330**

65 4,214,214
277 4,214,215

**CLASS 331**

94.5 C 4,214,216

**CLASS 334**

45 4,214,217
4,214,218

**CLASS 335**

23 4,214,219
153 4,214,220
212 4,214,221

**CLASS 336**

84 M 4,214,222

**CLASS 337**

293 4,214,223
323 4,214,224

**CLASS 338**

155 4,214,225

**CLASS 339**

14 R 4,213,664
17 D 4,213,665
75 M 4,213,666
103 R 4,213,667
217 R 4,213,668
272 UC 4,213,669

**CLASS 340**

52 F 4,214,227
148 4,214,229
149 A 4,214,230
207 R 4,214,231
347 AD 4,214,232
4,214,233
4,214,234
347 DA 4,214,235
642 4,214,236
686 4,214,237
690 4,214,238

**CLASS 343**

5 VQ 4,214,239
7 PF 4,214,240
4,214,241
7.7 4,214,242
8 4,214,243
18 E 4,214,244
103 4,214,245
750 4,214,246
752 4,214,247
756 4,214,248

**CLASS 346**

76 L 4,214,249
145 4,214,250

**CLASS 350**

96.16 4,213,670
96.18 4,213,677
96.21 4,213,671
96.23 4,213,672
162 SF 4,213,673
227 4,213,674
307 4,213,675
336 4,213,676

**CLASS 351**

7 4,213,678

**CLASS 353**

72 4,213,679

**CLASS 354**

12 4,213,680
21 4,213,681
23 D 4,213,682
4,213,688
24 4,213,683
118 4,213,684
193 4,213,685
195 4,213,686
213 4,213,687
234 4,213,689

**CLASS 355**

8 4,213,690
14 D 4,213,692
4,213,693
26 4,213,694
45 4,213,695
4,213,696
77 4,213,698

**CLASS 356**

70 4,213,699
73 4,213,700
124 4,213,701
239 4,213,702
244 4,213,703
349 4,213,704
350 4,213,705
351 4,213,697
353 4,213,706
387 4,213,707
429 4,213,708

**CLASS 357**

17 4,214,251
23 4,214,252
38 4,214,254
39 4,214,255
44 4,214,315
71 4,214,256

**CLASS 358**

3 4,214,257
4 4,214,258
8 4,214,259
17 4,214,260
19 4,214,261
4,214,262
22 4,214,263
44 4,214,264
93 4,214,265
108 4,214,266
111 4,214,267
127 4,214,268
140 4,214,269
154 4,214,270
166 4,214,271
170 4,214,272
188 4,214,273
193.1 4,214,274
223 4,214,275
256 4,214,276
283 4,214,277

**CLASS 360**

14 4,214,278
51 4,214,279
53 4,214,280
61 4,214,281
69 4,214,282
71 4,214,283
72.1 4,214,284
90 4,214,285
99 4,214,286
103 4,214,287

**CLASS 361**

6 4,214,288
20 4,214,289

154 4,214,290
338 4,214,291
386 4,214,292
433 4,214,293

**CLASS 362**

35 4,214,296
127 4,214,294
164 4,214,295
253 4,214,298
311 4,214,168
327 4,214,297

**CLASS 363**

8 4,214,299

**CLASS 364**

105 4,214,300
119 4,214,301
200 4,214,302
4,214,303
4,214,304
4,214,305
431 4,214,306
4,214,307
4,214,308
474 4,214,309
475 4,214,310
482 4,214,311

**CLASS 365**

182 4,214,312

**CLASS 366**

76 4,213,709
81 4,213,710
150 4,213,711
178 4,213,712
279 4,213,713

**CLASS 367**

1 4,214,313
2 4,214,314
27 4,214,226
51 Re.30,347

**CLASS 368**

82 4,213,294
152 4,213,293
204 4,213,292
236 4,213,295
263 4,213,291

**CLASS 370**

31 4,214,123
57 4,214,129
112 4,214,128

**CLASS 371**

40 4,214,228

**CLASS 375**

1 4,214,209
4 4,214,206
114 4,214,124

**CLASS 397**

29 4,214,253

**CLASS 400**

124 4,213,714
196.1 4,213,715
4,213,716

**CLASS 401**

18 4,213,717
131 Re.30,346

**CLASS 403**

197 4,213,718

**CLASS 404**

84 4,213,719

**CLASS 405**

195 4,213,720

**CLASS 408**

54 4,213,721
73 4,213,722
239 A 4,213,723

**CLASS 410**

64 4,213,590

**CLASS 414**

133 4,213,724
387 4,213,725
420 4,213,726
4,213,727
446 4,213,728
462 4,213,729
675 4,213,730
723 4,213,731
728 4,213,732
751 4,213,733

**CLASS 415**

4 4,213,734
21 4,213,735
182 4,213,736

**CLASS 416**

41 4,213,737
95 4,213,738
226 4,213,739

**CLASS 417**

63 4,213,740
79 4,213,741
206 4,213,742
229 4,213,743
310 4,213,744
363 4,213,745

**CLASS 418**

71 4,213,746

**CLASS 422**

15 4,213,934
111 4,213,935
133 4,213,936
142 4,213,937
143 4,213,938
151 4,213,939
246 4,213,940
267 4,213,941

**CLASS 423**

53 4,213,942
135 4,213,943
235 4,213,944
240 4,213,945
242 4,213,946
245 4,213,947
292 4,213,948
329 4,213,949
4,213,950
339 4,213,951
4,213,952
359 4,213,953
4,213,954
442 4,213,955
448 4,213,956
450 4,213,957
522 4,213,958
634 4,213,959

**CLASS 424**

47 4,213,960
54 4,213,961
78 4,213,962
80 4,213,963
85 4,213,964
89 4,213,965
123 4,213,966
128 4,213,967
177 4,213,968
4,213,969
180 4,213,970
4,213,974
181 4,213,971
4,213,972
200 4,213,973
4,213,975
224 4,213,976
241 4,213,977
4,213,978
243 4,213,979
246 4,213,980
247 4,213,981
248.52 4,213,982
250 4,213,983
4,213,984
4,213,985
4,213,986
251 4,213,987
4,213,988
263 4,213,989
269 4,213,990
273 B 4,213,993
273 P 4,213,992
273 R 4,213,991
4,213,994
4,213,995
274 4,213,996
283 4,213,997
285 4,213,998
289 4,213,999
300 4,214,000
4,214,001
4,214,002
301 4,214,003
305 4,214,004
309 4,214,005
318 4,214,006

**CLASS 425**

144 4,213,747
371 4,213,748
456 4,213,749
531 4,213,750
566 4,213,751

**CLASS 426**

44 4,214,007
53 4,214,008
558 4,214,009
573 4,214,010
591 4,214,011
607 4,214,012
629 4,214,013

**CLASS 427**

40 4,214,014
42 4,214,015
54.1 4,214,016
92 4,214,017
100 4,214,018
142 4,214,019
296 4,214,020
385 R 4,214,021
435 4,214,022

**CLASS 428**

11 4,214,023
41 4,214,024
67 4,214,025
4,214,026
113 4,214,027
159 4,214,028
200 4,214,029
212 4,214,030
213 4,214,031
255 4,214,033
280 4,214,032
315 4,214,034
340 4,214,035
358 4,214,036
367 4,214,037
411 4,214,038
414 4,214,039
458 4,214,040
607 4,214,041
678 4,214,042

**CLASS 429**

27 4,214,043
4,214,044
87 4,214,045
198 4,214,046

**CLASS 430**

114 4,213,872
432 4,213,782
448 4,214,047
533 4,213,783
616 4,213,784

**CLASS 432**

14 4,213,752
115 4,213,754
247 4,213,753

**CLASS 433**

49 4,213,755
126 Re.30,340
4,213,243
4,213,756

**CLASS 435**

7 4,214,048
23 4,214,049
29 4,214,050
55 4,214,051
4,214,052
291 4,213,825

**CLASS 455**

1 4,214,208
20 4,214,205
95 4,214,207
141 4,214,316
190 4,214,212
282 4,214,210
287 4,214,211

**CLASS 474**

264 4,213,350

**CLASS 521**

70 4,214,053
95 4,214,054
137 4,214,055

**CLASS 525**

71 4,214,056
100 4,214,057
348 4,214,058
356 4,214,059
387 4,214,060
455 4,214,061
470 4,214,062

**CLASS 526**

68 4,214,063
193 4,214,064

**CLASS 528**

27 4,214,065
28 4,214,066
93 4,214,067
98 4,214,068
167 4,214,069
220 4,214,070
222 4,214,071
272 4,214,072
369 4,214,073

**CLASS 536**

10 4,214,074
17 R 4,214,075
4,214,076
4,214,077
4,214,078
4,214,079
4,214,080

**CLASS 542**

424 4,214,081

**CLASS 544**

189 4,214,082
277 4,214,083

**CLASS 546**

72 4,214,084
97 4,214,085
290 4,214,086
319 4,214,087
321 4,214,088

**CLASS 548**

151 4,214,089
250 4,213,903
377 4,214,090

**CLASS 549**

62 4,214,091
64 4,214,092

**CLASS 556**

419 4,213,914

**CLASS 560**

34 4,214,093
42 4,214,094
57 4,214,095
147 4,214,096
213 4,214,097
231 4,214,098
256 4,214,099

**CLASS 562**

416 4,214,100
421 4,214,101
564 4,214,102

**CLASS 568**

424 4,213,920
455 4,213,921
639 4,214,103
648 4,214,104
771 4,214,105
864 4,214,106
897 4,214,107
909 4,214,109

**CLASS 585**

23 4,214,108
241 4,214,110
255 4,214,111
532 4,214,112
634 4,214,113
715 4,214,114
716 4,214,115
747 4,214,116

## CLASSIFICATION OF DESIGNS

D2— 183 255,952
254 255,953
264 255,954
275 255,955
309 255,956
320 255,957
D3— 5 255,958
D6— 3 255,959
15 255,960
28 255,961
69 255,962
79 255,963
181 255,964
191 255,965
201 255,966
D7— 9 255,967
38 255,968
48 255,969
97 255,970
102 255,971
128 255,972
138 255,973
152 255,974
160 255,975
187 255,976
210 255,977
D8— 25 255,978
255,979
52 255,980
98 255,981
366 255,982
382 255,983
D9— 1 255,984
61 255,985
64 255,986
71 255,987
83 255,988
131 255,989
147 255,990
245 255,991
255,992
255,993
255,994
275 255,995
D10— 15 255,996
57 255,997
73 255,998
96 255,999
256,000
111 256,001
121 256,002
D11— 43 256,003
110 256,004
D12— 12 256,005
40 256,006
53 256,007
147 256,008
157 256,009
D13— 24 256,010
38 256,011
256,012
D14— 5 256,013
33 256,014
37 256,015
95 256,016
D15— 23 256,017
28 256,018
105 256,019
112 256,020
140 256,021
145 256,022
D16— 26 256,023
59 256,024
78 256,025
D17— 14 256,026
D18— 6 256,027
D19— 60 256,028
76 256,029
D20— 4 256,030
256,031
10 256,032
D21— 34 256,033
55 256,034
81 256,035
92 256,036
104 256,037
230 256,038
244 256,039
245 256,040
D22— 15 256,041
23 256,042
25 256,043
28 256,044
256,045
D23— 47 256,046
115 256,047
151 256,048
D24— 9 256,049
12 256,050
50 256,051
55 256,052
56 256,053
64 256,054
256,055
D25— 9 256,056
D26— 29 256,057
46 256,061
D27— 14 256,058
D28— 46 256,059
D30— 2 256,060
D92— 1 P 256,062
256,063

## CLASSIFICATION OF PLANTS

P.— 20 4,576
69 4,577
4,578

# GEOGRAPHICAL INDEX

# OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
| Alaska | 2 | Louisiana | 22 | Pennsylvania | 42 |
| American Samoa | 3 | Maine | 23 | Puerto Rico | 43 |
| Arizona | 4 | Maryland | 24 | Rhode Island | 44 |
| Arkansas | 5 | Massachusetts | 25 | South Carolina | 45 |
| California | 6 | Michigan | 26 | South Dakota | 46 |
| Canal Zone | 7 | Minnesota | 27 | Tennessee | 47 |
| Colorado | 8 | Mississippi | 28 | Texas | 48 |
| Connecticut | 9 | Missouri | 29 | Utah | 49 |
| Delaware | 10 | Montana | 30 | Vermont | 50 |
| District of Columbia | 11 | Nebraska | 31 | Virginia | 51 |
| Florida | 12 | Nevada | 32 | Virgin Islands | 52 |
| Georgia | 13 | New Hampshire | 33 | Washington | 53 |
| Guam | 14 | New Jersey | 34 | West Virginia | 54 |
| Hawaii | 15 | New Mexico | 35 | Wisconsin | 55 |
| Idaho | 16 | New York | 36 | Wyoming | 56 |
| Illinois | 17 | North Carolina | 37 | U.S. Air Force | 57 |
| Indiana | 18 | North Dakota | 38 | U.S. Army | 58 |
| Iowa | 19 | Ohio | 39 | U.S. Navy | 59 |
| Kansas | 20 | Oklahoma | 40 | | |


(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

## PATENTS

1 : 4,213,721
4,214,272
4 : 4,213,306
4,213,706
5 : 4,213,445
6 : 4,213,269
4,213,276
4,213,419
4,213,653
4,213,703
4,213,729
4,213,768
4,213,793
4,213,866
4,213,930
4,213,952
4,213,975
4,214,046
4,214,125
4,214,175
4,214,179
4,214,266
4,214,267
4,214,279
4,214,286
4,214,287
4,214,312
8 : 4,213,452
9 : 4,213,437
4,213,496
4,213,584
4,213,709
4,213,710
4,213,735
4,214,042
4,214,263
01 : 4,213,924
04 : 4,213,394
4,213,495
05 : 4,213,408
06 : Re.30,346
4,213,214
4,213,243
4,213,247
4,213,252
4,213,255
4,213,294
4,213,302
4,213,328
4,213,342
4,213,377
4,213,382
4,213,387

4,213,412
4,213,417
4,213,418
4,213,423
4,213,448
4,213,450
4,213,451
4,213,473
4,213,488
4,213,498
4,213,504
4,213,508
4,213,548
4,213,550
4,213,570
4,213,586
4,213,598
4,213,611
4,213,624
4,213,642
4,213,654
4,213,658
4,213,664
4,213,668
4,213,684
4,213,701
4,213,704
4,213,705
4,213,724
4,213,736
4,213,764
4,213,813
4,213,818
4,213,840
4,213,845
4,213,850
4,213,851
4,213,927
4,213,941
4,213,951
4,213,973
4,213,991
4,214,013
4,214,118
4,214,122
4,214,137
4,214,145
4,214,160
4,214,165
4,214,171
4,214,194
4,214,196
4,214,226

4,214,239
4,214,259
4,214,280
4,214,313
4,214,314
08 : 4,213,333
4,213,447
4,213,549
4,213,694
4,213,870
4,213,873
4,213,882
4,214,234
09 : 4,213,205
4,213,240
4,213,253
4,213,258
4,213,291
4,213,296
4,213,340
4,213,402
4,213,443
4,213,518
4,213,537
4,213,593
4,213,799
4,213,811
4,213,907
4,214,037
4,214,041
4,214,157
10 : 4,213,219
4,213,773
4,213,837
4,213,949
4,213,950
4,214,060
4,214,070
11 : 4,213,670
12 : Re.30,344
4,213,208
4,213,271
4,213,275
4,213,305
4,213,315
4,213,373
4,213,380
4,213,432
4,213,469
4,213,487
4,213,529
4,213,601
4,213,605

4,213,627
4,213,636
4,213,647
4,213,661
4,213,730
4,213,860
4,213,876
4,214,008
4,214,017
4,214,147
4,214,178
4,214,215
4,214,244
13 : 4,213,246
4,213,283
4,213,816
15 : 4,214,238
17 : 4,213,216
4,213,260
4,213,268
4,213,273
4,213,300
4,213,303
4,213,319
4,213,332
4,213,370
4,213,416
4,213,454
4,213,458
4,213,479
4,213,484
4,213,490
4,213,511
4,213,561
4,213,565
4,213,592
4,213,609
4,213,612
4,213,639
4,213,687
4,213,725
4,213,767
4,213,770
4,213,829
4,213,872
4,213,877
4,213,896
4,213,913
4,213,971
4,213,972
4,213,974
4,214,075
4,214,076

4,214,077
4,214,078
4,214,079
4,214,080
4,214,114
4,214,116
4,214,188
4,214,220
4,214,227
4,214,237
4,214,274
4,214,284
4,214,296
18 : 4,213,327
4,213,400
4,213,513
4,213,534
4,213,556
4,213,633
4,213,738
4,213,741
4,213,893
4,213,996
4,214,045
4,214,103
4,214,153
19 : 4,213,274
4,213,348
4,213,424
4,213,525
4,214,092
4,214,200
20 : 4,213,310
4,213,506
4,213,606
4,213,809
4,213,978
21 : 4,213,250
4,213,313
4,213,338
4,213,772
22 : Re.30,341
4,213,345
4,213,527
4,213,530
4,213,881
4,213,888
4,213,968
24 : 4,213,369
4,213,391
4,213,460
4,213,540
4,213,646

4,213,874
4,214,240
4,214,271
25 : Re.30,342
4,213,221
4,213,263
4,213,298
4,213,324
4,213,329
4,213,404
4,213,436
4,213,466
4,213,467
4,213,478
4,213,486
4,213,665
4,213,671
4,213,678
4,213,806
4,213,823
4,213,854
4,214,019
4,214,056
4,214,099
4,214,119
4,214,138
4,214,164
4,214,190
4,214,193
4,214,201
4,214,210
4,214,229
4,214,248
4,214,285
4,214,303
26 : 4,213,202
4,213,210
4,213,226
4,213,272
4,213,309
4,213,326
4,213,336
4,213,355
4,213,376
4,213,415
4,213,426
4,213,428
4,213,435
4,213,441
4,213,442
4,213,477
4,213,481
4,213,493

4,213,523
4,213,564
4,213,595
4,213,620
4,213,645
4,213,652
4,213,734
4,213,742
4,213,744
4,213,779
4,213,831
4,213,833
4,213,886
4,213,894
4,213,964
4,214,051
4,214,052
4,214,096
4,214,121
4,214,298
4,214,307
27 : 4,213,241
4,213,261
4,213,482
4,213,503
4,213,505
4,213,539
4,213,613
4,213,648
4,213,689
4,214,029
4,214,133
4,214,292
4,214,310
29 : 4,213,379
4,213,413
4,213,474
4,213,475
4,213,546
4,213,567
4,213,590
4,213,934
4,214,120
4,214,243
32 : 4,213,264
4,213,782
33 : 4,213,644
34 : 4,213,218
4,213,229
4,213,259
4,213,266
4,213,343
4,213,359
4,213,395
4,213,410
4,213,411
4,213,516
4,213,614
4,213,631

4,213,667
4,213,669
4,213,698
4,213,755
4,213,769
4,213,798
4,213,801
4,213,802
4,213,807
4,213,815
4,213,826
4,213,832
4,213,847
4,213,848
4,213,853
4,213,862
4,213,887
4,213,906
4,213,912
4,213,921
4,213,932
4,213,961
4,213,966
4,213,988
4,213,997
4,214,000
4,214,002
4,214,028
4,214,081
4,214,087
4,214,102
4,214,107
4,214,208
4,214,231
4,214,261
35 : 4,213,836
36 : 4,213,209
4,213,215
4,213,230
4,213,284
4,213,286
4,213,367
4,213,383
4,213,407
4,213,420
4,213,463
4,213,464
4,213,471
4,213,497
4,213,545
4,213,603
4,213,610
4,213,621
4,213,657
4,213,695
4,213,702
4,213,717
4,213,727
4,213,733

4,213,765
4,213,794
4,213,838
4,213,841
4,213,868
4,213,883
4,213,938
4,213,955
4,213,965
4,213,977
4,213,981
4,214,004
4,214,009
4,214,010
4,214,018
4,214,039
4,214,047
4,214,084
4,214,085
4,214,142
4,214,152
4,214,170
4,214,173
4,214,182
4,214,214
4,214,216
4,214,247
4,214,253
4,214,256
4,214,264
4,214,273
4,214,277
4,214,294
4,214,315
4,214,316
37 : 4,213,312
4,213,543
4,213,749
4,214,020
4,214,023
39 : 4,213,206
4,213,235
4,213,238
4,213,244
4,213,267
4,213,279
4,213,317
4,213,331
4,213,334
4,213,339
4,213,444
4,213,510
4,213,512
4,213,542
4,213,560
4,213,650
4,213,655
4,213,696

4,213,718
4,213,737
4,213,796
4,213,827
4,213,828
4,213,891
4,213,915
4,213,917
4,213,936
4,213,947
4,213,948
4,213,998
4,213,999
4,214,011
4,214,024
4,214,038
4,214,061
4,214,131
4,214,144
4,214,168
4,214,172
4,214,183
4,214,199
4,214,219
4,214,224
40 : 4,213,357
4,213,381
4,213,522
4,213,719
4,213,762
4,213,800
4,213,812
4,213,846
4,213,856
4,213,869
4,213,879
4,213,935
4,213,957
4,214,021
4,214,030
4,214,109
4,214,115
4,214,158
41 : 4,213,371
4,213,446
4,213,640
4,213,726
42 : Re.30,343
4,213,224
4,213,227
4,213,239
4,213,254
4,213,299
4,213,304
4,213,308
4,213,322
4,213,344
4,213,356

4,213,365
4,213,483
4,213,489
4,213,531
4,213,571
4,213,608
4,213,663
4,213,732
4,213,752
4,213,780
4,213,781
4,213,804
4,213,889
4,213,905
4,213,943
4,213,982
4,214,003
4,214,006
4,214,065
4,214,067
4,214,071
4,214,089
4,214,150
4,214,204
4,214,213
4,214,225
4,214,241
4,214,255
45 : 4,214,035
4,214,135
47 : 4,213,233
4,213,282
4,213,457
4,213,547
4,213,707
4,213,791
4,213,979
48 : Re.30,347
4,213,203
4,213,207
4,213,223
4,213,237
4,213,352
4,213,433
4,213,476
4,213,480
4,213,492
4,213,500
4,213,502
4,213,528
4,213,600
4,213,618
4,213,626
4,213,641
4,213,740
4,213,761
4,213,865
4,213,875

4,213,880
4,213,904
4,213,937
4,213,939
4,214,050
4,214,063
4,214,126
4,214,128
4,214,129
4,214,132
4,214,156
4,214,232
4,214,233
4,214,302
49 : 4,213,262
4,213,575
51 : Re.30,340
4,213,204
4,213,307
4,213,314
4,213,368
4,213,461
4,213,616
4,213,666
4,213,697
4,213,714
4,213,716
4,213,743
4,213,797
4,213,824
4,214,197
4,214,236
4,214,308
53 : 4,213,289
4,213,526
4,213,585
4,213,587
4,213,628
4,213,863
4,214,130
4,214,198
4,214,269
54 : 4,213,399
4,213,566
4,213,615
4,214,055
55 : 4,213,211
4,213,242
4,213,353
4,213,459
4,213,521
4,213,559
4,213,649
4,213,923
4,213,933
4,214,155
4,214,288
58 : 4,214,083

## DESIGN PATENTS

1 : 256,049
6 : 255,981
256,025
256,030
256,035
8 : 256,033
9 : 255,984
04 : 256,001
06 : 255,960
255,961
255,964
256,007
256,014
256,027
256,046

256,052
256,058
09 : 256,006
256,041
12 : 255,963
256,003
256,051
256,054
256,055
17 : 255,969
255,971
255,988
255,991
255,994
256,002

256,019
256,040
256,050
256,053
18 : 256,039
20 : 255,982
25 : 255,990
256,015
256,059
26 : 255,954
255,966
256,005
256,018
256,038
256,045

256,060
27 : 255,970
255,978
256,020
28 : 255,962
29 : 255,993
255,995
256,026
256,031
256,047
31 : 255,959
34 : 255,956
255,983
255,986

256,063
36 : 255,952
255,985
256,013
256,023
256,032
256,037
39 : 255,953
255,968
255,977
256,062
40 : 256,044
41 : 255,979
256,009

42 : 255,974
256,004
256,061
44 : 255,998
46 : 256,056
47 : 255,992
48 : 256,028
49 : 255,980
256,048
51 : 255,965
255,976
256,029
53 : 255,958
256,034

## PLANT PATENTS

06 : 4,576

U.S. GOVERNMENT PRINTING OFFICE : O—1980

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Possessions, the Canadian Provinces of Prince Edward Island and the Canadian Provinces)


DESIGN PATENTS

PLANT PATENTS

## CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

---

## SUBSCRIPTION ORDER FORM

**SUBSCRIPTION ORDER FORM**

**ENTER MY SUBSCRIPTION TO:**

**@ $ Domestic; @ $ Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

CHANGE OF ADDRESS FORM

PLEASE PRINT OR TYPE

Name—First, Last

Company Name or Additional Address Line

Street Address

City | State | ZIP Code

For Change

SUBSCRIPTION ORDER FORM

Enter my subscription to:

Domestic $ ☐ Foreign

PLEASE PRINT OR TYPE

Name—First, Last

Company Name or Additional Address Line

Street Address

City | State | ZIP Code

For Change

☐ Check if for Change of Address Only

New orders only to:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Philip M. Klutznick, *Secretary*

PATENT AND TRADEMARK OFFICE
Sidney A. Diamond, *Commissioner*